AN ANALYSIS OF RECENT STUDIES IN ENGLISH EDUCATION IN CHINA USING AN APPLICATION OF BIG DATA IN ENGLISH TEACHING

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With the continuous advancement of science and technology, education has entered the era of big data based on computer network technology, powerful cloud storage technology, and computational analysis technology. The era of big data is changing society at a rapid pace. Big data can transform how we teach English, the dominant position in English teaching, the evaluation methods of English teaching, and education in general. Big data can also be applied to the remote teaching of English history, teaching party history, and English exam history in the English classroom. By applying big data to the history of English teaching, we can significantly improve China's English teaching industry and promote the reform of China's education industry. English is a universal language in today's globalized world, and it has become even more critical. Therefore, English teaching should be reformed towards application, and learning English can be a tool that significantly impacts people's lives, especially in the context of China, where English is not the first language (L1).

Keywords: big data; English education; China; English language teaching

Background of the study

In the context of big data, information technology and internet technology are constantly evolving and being widely applied in education and teaching due to their unique advantages, which has led to varying degrees of transformation in traditional education and teaching work (Lou et al., 2023; Ying, 2023; Zhou, 2023).

Big data collects, analyzes, and processes data information, explores patterns, and provides personalized services for users (Lu et al., 2023). From the perspectives of educational model reform and English subject development, the application of big data is a mainstream development trend (Bai, 2023; Dong, 2023).

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It promotes profound changes in traditional English teaching models, effectively integrates online education resources, provides students with a convenient and relaxed learning environment, cultivates good self-directed learning ability, and plays an important role in promoting the comprehensive development of students' English application ability. Therefore, strengthening the research on the impact of big data on English teaching can help promote educational reform and improve the effectiveness of English teaching (Bai, 2023; Lin, 2023).

**Concepts of Big Data**

Big data refers to a collection of data that cannot be captured, managed, and processed using conventional software tools within a certain time frame (Zhang, 2023). It is a massive, high-growth, and diverse information asset that requires new processing modes to have stronger decision-making power, insight, and process optimization capabilities. Big data has five major characteristics: volume, speed, diversity, low value density, and authenticity. It does not have a statistical sampling method; it only observes and tracks what happens. The use of big data tends to favor the use of predictive analysis, user behavior analysis, or certain other advanced data analysis methods (Bai, 2023; Lin, 2023; Wei, 2023).

Gartner Inc., a research institution for 'Big Data', provides this definition. Big data "requires new processing modes to have stronger decision-making power, insight, and process optimization capabilities to adapt to massive, high growth rates and diverse information assets (www.gartner.com).

The definition given by McKinsey Global Research is a data set that is large enough to greatly exceed the capabilities of traditional database software tools in terms of acquisition, storage, management, and analysis. It has four major characteristics: massive data scale, rapid data flow, diverse data types, and low value density (www.mckinley.com).

The strategic significance of big data technology lies not in mastering massive amounts of data but in the specialized processing of meaningful data. In other words, if big data is compared to an industry, the key to achieving profitability in this industry is to improve the "processing ability" of data and achieve "value-added" of data through "processing" (Wang & Sui, 2019).

From a technical perspective, the relationship between big data and cloud computing is as inseparable as the front and back of a coin. Big data cannot be processed using a single computer and must adopt a distributed architecture. Its characteristic lies in the distributed data mining of massive data. But it must rely on distributed processing, distributed databases, cloud storage, and virtualization technologies in cloud computing (Wang & Sui, 2019; Zhang, 2023).

**Significance of the study**

With the rapid development of information technology, big data technology is coming to us with a new posture. Big data has triggered global reform and innovation, and its impact in the field of education is also extensive and far-reaching (Bai, 2023; He, 2023; Shi, 2023). It has had a positive impact on higher education teaching concepts, teaching models, and learning methods, and is no exception to English education (Zhang, 2023).

The role of big data technology in promoting the improvement of English teaching levels cannot be underestimated. Big data is a literal translation of big data.
The proposal of big data is relative to typical data, with a large amount of collection and storage, fast processing, and calculation speed, which cannot be compared to typical data (Zhang, 2023). Big data is a collection of data consisting of a large amount, complex structure, and numerous types. It is a data processing and application model based on cloud computing and is an intellectual resource and knowledge service capability formed through the integration, sharing, and cross-reuse of data.

The application of big data in today's society has involved various aspects and become an important production factor (Bai, 2023). Analyzing and researching the new characteristics of high school English teaching in the era of big data is of great value for improving the effectiveness of English teaching and promoting the reform of English teaching in the new era.

Reform of the college entrance examination in English

In 2014, the State Council issued the "Implementation Opinions of the State Council on Deepening the Reform of the Examination and Enrollment System" regarding the phenomenon that "one exam determines one's lifetime" in foreign languages, which clearly pointed out the strengthening of the construction of the foreign language ability evaluation system (Lin, 2023).

In 2014, Shanghai and Zhejiang provinces, respectively, introduced pilot plans for the comprehensive reform of the college entrance examination, aiming to provide references and demonstrations for other provinces and cities. One of the reform pilot projects, Shanghai, has launched a two-year exam model that includes written tests and listening and speaking abilities.

Zhejiang Province, which has a solid foundation in high school curriculum reform and college entrance examination enrollment reform, has implemented a policy of keeping the total score unchanged and achieving two years of effective results. It can be seen that the current situation requires students to focus on improving their comprehensive foreign language abilities (Lin, 2023; Wu et al., 2023).

Creating new characteristics of college English teaching in the era of Big Data

The emergence of big data technology has profoundly changed many aspects of education. In the era of big data, college English teaching has shown new characteristics, mainly manifested as follows:

Combining ubiquitous English learning with a big data push

With the development of modern information technology, English learning methods have undergone significant changes, from the initial use of blackboards and textbooks to internet-based electronic learning, mobile learning, and ubiquitous learning. Ubiquitous learning, also known as U-learning, refers to a learning method where anyone can acquire any knowledge no matter where or at any time (Bai, 2023; Wen, 2023).

This anytime, anywhere learning is achieved through ubiquitous networks. In ubiquitous learning, students arrange their personalized learning according to their time plan, learning progress, learning ability, and preferences, combining online and offline learning to achieve seamless integration of continuous learning and fragmented time (He, 2023; Ma, 2023).
Although ubiquitous learning grants students the freedom to choose time and infinite learning space, due to the vast and complex nature of modern information resources, students are prone to losing their direction, confusion, and scattered energy during learning, mainly manifested in the choice of learning strategies and methods, the selection of learning content and paths, and the evaluation of learning processes and effects (Zhang, 2023).

The big data push system has effectively solved these problems. Firstly, the information service system of big data will search, customize, and push relevant English knowledge learning information for students based on their needs, so that students can obtain the optimal resources they need. At the same time, it will also collect and record students' learning behavior, usually including learning logs, learning habits, learning time, learning methods and strategies, learning ability tendencies, and the entire learning process. Then, the big data analysis system will deeply mine these records, identify regular features, analyze individual attitudes, interests, potentials, learning levels, and learning methods, as well as areas that need improvement (Wu et al., 2023).

Then, through the big data push system, relevant information and data will be timely transmitted to teachers and students, providing personalized adaptive services. The big data push is aimed at personalized purposes, integrating and processing information obtained from various channels, and actively providing services to teachers and students (Lou & Yang, 2023). It has the characteristics of precision, timeliness, convenience, and efficiency, running through the entire learning process, providing a new experience for the smooth development of ubiquitous learning.

**Effective English learning and real-time interaction are interdependent.**

Effective learning is aimed at low learning efficiency and unsatisfactory learning outcomes. It refers to the learning behavior of students, under the guidance of teachers, adopting suitable learning strategies for their learning content, actively participating in the learning process, efficiently completing knowledge construction, and thereby achieving learning goals and optimizing their own knowledge structure.

Big data technology with interactive and intelligent characteristics provides a feasible way for effective English learning. Firstly, big data technology will collect and store relevant information on English learning through the internet, such as various English teaching resources, public classes, English culture, English novels, English movies and TV dramas, etc., providing convenience for students to carry out their studies. At the same time, the language scenario simulation service of Big Data can also create real scenarios, simulate and apply them, enhance students' sense of being on site, and thus enhance their interest in learning, ultimately helping to achieve real-time interaction between students and learning content (He, 2023). In addition, the big data analysis system will conduct real-time analysis, feedback, and guidance based on the specific situations of different students, achieving human-computer interaction.

At the same time, the big data interactive learning system can help students and teachers, as well as other scholars, students, and other English learners, communicate with each other, solve problems, share experiences, inspire and guide each other, and achieve dynamic interaction between people (Shi, 2023).

The above real-time interaction ultimately achieves the interaction between new and old concepts in students' minds, enabling them to deeply understand English knowledge and achieve knowledge transfer and application to new problems.
**Intensify critical thinking skills in English teaching.**

With the arrival of the big data era, the critical thinking ability of students in college English teaching has been unprecedentedly strengthened and improved. This improvement is unconsciously achieved in English learning and is mainly manifested in the following aspects:

First, big data technology is more efficient in searching for and transmitting information than before. Teachers and students can effectively access various timely and updated English learning resources anytime and anywhere (Chen, 2023).

When they organize, analyze, and distinguish this information, they will inevitably apply critical thinking skills such as reasoning, logic, and judgment. The emergence of ubiquitous learning in the era of big data has further strengthened students' ability to learn English independently (He, 2023; Shi, 2023).

Autonomous learning requires students to have the ability to choose their own learning strategies, self-management, self-monitoring, and self-evaluation. Therefore, in the process of autonomous learning, students' analytical, judgmental, and self-correcting abilities will be greatly trained and improved. These two abilities are the basic conditions for the formation of critical thinking abilities.

Thirdly, big data technology has the ability to store a large amount of English learning information resources, so when students encounter situations where they do not understand, they can repeatedly learn and speculate until they master them.

The improvement of understanding and reflective abilities is a necessary condition for developing critical thinking.

Fourthly, the resource sharing of big data technology has achieved resource optimization, and a large number of English online courses have emerged with high density. The high-quality courses gathered by these renowned teachers have greatly broadened the horizons of teachers and students, inspired their thinking, helped to form divergent thinking, and expanded the space for the development of critical thinking.

Fifth, big data technology can fully grasp students' English learning characteristics through analysis systems, help develop students' personalities, and thus help form students' unique insights, thereby improving their critical thinking abilities. Sixth, big data technology makes real-time interaction more frequent and easy.

Through real-time interaction, students can communicate across time and space in a relaxed, safe, and enjoyable atmosphere, inspire each other, and collide with new perspectives and ideas, thereby helping to form an open and realistic critical thinking spirit and critical thinking skills for analysis and evaluation (He, 2023).

**Investigation and analysis of the current situation of information technology and curriculum integration**

**Survey activity design**

This survey activity was conducted in the form of questionnaires and interviews, covering students, subject teachers, information technology teachers, and the school's information environment, in order to obtain practical and effective data.
Investigation purpose
The main purpose of this survey is to gain a specific understanding of middle school students' satisfaction with traditional teaching, their attitude towards the introduction of information technology into English classrooms, English teachers' awareness of curriculum integration, and the information environment of the school in order to provide practical suggestions for proposing a curriculum integration model for the school.

Survey subjects
For the survey questionnaire, it was conducted in the experimental classes of Grade 5, Grade 6, and Grade 17 of the school. For the interview, six people were randomly selected from the three classes, and young teachers and English subject directors from the school were interviewed.

The survey has a wide scope and strong representativeness.

Design of the survey questionnaire
Before the formal use of the questionnaire, the staff of this study conducted small-scale testing to improve the questionnaire. 30 people were selected from Xuzhou Third Middle School, including 15 girls and 15 boys. Further modifications and improvements have been made to the difficulty, order, weight, and language expression of the questions in the questionnaire, and the questionnaire has been finalized.

This survey adopts the self-designed 'Survey Questionnaire on Middle School Students' Satisfaction with Current English Teaching and Future Expectations'.

The questionnaire is divided into three parts. The first part is a survey on personal basic information, including the basic information of the respondents and the level of emphasis they place on various English subjects.

The second part is about the impact of subject changes in the college entrance examination on English learning. The third part is information on students' satisfaction with information technology methods in English classrooms.

Distribution and collection of questionnaires
The questionnaire was distributed in paper form, with researchers providing guidance on filling it out. A total of 120 questionnaires were distributed, and 117 were collected, for an effective rate of 97.5%.

Conduct of interviews
This interview is divided into two parts, including student interviews and teacher interviews. Six students were randomly selected from the three classes distributed in the questionnaire for student interviews. Teacher interviews were conducted with two teachers, English teachers from Class 6 of Senior High School and subject directors from their respective grades.
The current situation of information technology and English curriculum integration

Low level of integration, mainly based on simple PPT displays
Xuzhou Third Middle School is a digital campus experimental base in Jiangsu Province and is an old key high school in Xuzhou.

Both teachers and teaching resources are abundant, and students have consistently achieved excellent results in the college entrance examination. Although each class is equipped with multimedia devices, they lack a network environment and can only perform simple PPT presentations. Some teachers have revealed that teaching time is too tight, and sometimes PPT is too late to do, and other information technology methods are less used.

Implement the "Lecture Plan" to assist students, and continue to focus on cramming in class
Since the implementation of the "Learning and Lecture Plan" in Xuzhou in 2014, various classes and grades have formulated specific teaching content.

The guided learning plan aims to cultivate students' abilities in self-directed learning, exploratory learning, and collaborative learning through "learning in," "speaking out," and "realizing learning." The questionnaire conducted data analysis on the issue of "class format."

The results in Fig. 1 show that 50.5% of students stated that they still use full-class teaching as the main method in class, but 14.5% of students also accept the teaching plan. And through interviews with teachers, it was stated that they were all engaged in a learning and teaching plan.

From the different responses from teachers and students, it can be seen that the implementation of the learning and teaching plan is superficial, or mainly focused on full lectures.

![Teaching methods in the English classroom](image)

Figure 1 - Teaching methods in the English classroom
(made by the author)
**Analysis of the current situation of the integration of information technology and the English curriculum**

Through literature analysis, the problems of curriculum integration mainly focus on two categories: the first type is improper integration, and the problems that arise mainly include improper teaching design, neglect of curriculum characteristics, and neglect of emotional communication between teachers and students.

The second type is the difficulty in implementing integration, mainly due to weak integration awareness, slow actual action, and an unclear understanding of integration concepts. The reasons for the unfavorable impact of curriculum integration in Xuzhou Third Middle School belong to the second category, mainly manifested as unclear effects on curriculum integration, low information literacy of teachers and students, and insufficient digital infrastructure.

**Unclear effect on course integration**

The questionnaire conducted data analysis on the issue of "emphasis on subjects in Xuzhou Third Middle School." The results in Fig. 2 show that, compared to the 105 emphasis on mathematics, information technology is only 10. Through interviews with six randomly selected students and teachers, it was found that students have little understanding of information technology education.

Through the analysis of the questionnaire and interview content, it was found that the school attached more importance to the English vocabulary section. Teachers believed that information technology was not helpful in memorizing words and even made mistakes in setting teaching objectives. The significance and effectiveness of curriculum integration were not clear.

**Low information literacy among teachers and students**

Due to the fact that the investigators were information technology teachers from Class 5 and Class 17, it was found through the information technology teaching process that students had lower information literacy. Through the analysis of interview content with subject teachers, it can be seen that some subject teachers also believe that their information literacy is weak and they are not even proficient in operating multimedia facilities in the classroom.

The computer classroom and teacher office building of Xuzhou Third Middle School are located on a separate teaching building roof. There is less communication between
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subject teachers and information technology teachers, and there is no communication
between teachers except for the cognitive characteristics of students.

*Insufficient digital infrastructure*

The survey found that students are dissatisfied with their current English learning
situation and hope to have access to standard foreign language input. Through a survey of
school resources, it was found that the school has equipped a small number of voice
classrooms, but they are not frequently used.

There are only three computer rooms in the school, each with approximately 60 seats. The sound effects of two classes have been damaged for a long time and have not been repaired. If there is a need for public class recording, the classroom will be moved to the sixth floor of the office building, separate from the teaching building—the information technology floor.

The tense digital infrastructure and distant distance have gradually made teachers lose the courage to practice.

*Design of the integration model of information technology and middle school
English curriculum*

Analyzing Massive Open Online Courses (MOOC), it was found that the teacher effect, the refinement of course content and the characteristics of open communities provide a certain path for the design and development of curriculum integration, supporting and promoting collaborative learning among teachers in allocating teaching time, diverse evaluations, and students' creative and open learning. In this section, the theoretical basis and design ideas will be elaborated on (He, 2023)

*Theoretical basis*

Under the baton of the college entrance examination, the traditional teaching mode leans towards knowledge transfer, which means there are few opportunities to express themselves verbally, from textbooks to students' notebooks.

This model is based on Piaget and Vygotsky's constructivist theory and helps students establish habits of discovery and willingness to learn through systematic teaching design. With the assistance of second language acquisition theory and collaborative learning theory, achieving excellent resource sharing, fully utilizing classroom preparation time, and implementing diversified teaching evaluation promote the common development of teachers and students (Zhang, 2022).

*Second language acquisition theory*

The input hypothesis was first proposed by Krashen (cited in Barkley et al., 2014), who believed that learning and acquisition are two different concepts. Language acquisition involves unconsciously accepting and understanding a large amount of input information (language materials) and requires emotional demands.

These language materials need to include four characteristics: comprehensibility, students only need to understand the language materials, so they will not spend a lot of attention on sentence analysis;
Stimulate students' interest, which helps them stimulate their intrinsic motivation and actively engage in the learning process;

Not overly emphasizing grammar, he believes that with a large amount of language input and use, these errors will automatically disappear.

Input a large amount of materials and conversations.

Foster (1998) found that actively participating in classroom communication activities can help students develop a second language in several ways: increasing language usage time in the classroom, reducing time spent solely listening to others, avoiding harmful anxiety and restraint, increasing the time for teachers to provide individual guidance, and creating a positive and relaxed learning environment (cited in Dong, 2023).

It can be seen that creating a language environment that helps students have a lot of input and output opportunities is very important.

Collaborative learning theory

Collaborative Learning (CL) is a teaching theory and strategy that emerged in the United States in the 1970s and made substantial progress from the mid-1920s to the 1980s (Bruffee, 1973, 1984, 1986, 1995, 1999; Barkley et al., 2014).

Professor Hu (2023) proposed that the basic elements of collaborative learning are positive interdependence, face-to-face promotion of sexual interaction, personal responsibility, social skills, and group self-processing.

However, it should be noted that the number of people in the collaboration group should preferably be kept at 3-5. And a large number of surveys have shown that in the mixed group, the advice of girls is often depreciated or greatly discounted. Adopting groups consisting entirely of boys, or two girls, one or two boys, or all girls, should avoid groups consisting of one girl, two boys, or three boys.

The design and arrangement of collaborative tasks should also closely follow the learning objectives and align with learners' cognitive level, teaching environment, and task volume (Labonté & Smith, 2022). It is difficult for a teacher to collaborate and communicate with all students in the class, so it is very necessary to establish a collaborative group, and successful collaborative groups can help reduce anxiety and restraint (Yang, 2023).

Course integration mode design

Based on constructivism, second language acquisition, and collaborative learning theories, this model is detailed in three parts: pre-class activities (setting context, task-driven), classroom implementation (high-quality input to alleviate teaching pressure, group collaborative exercises to increase classroom communication activities), and post-class (theme essay output and individual guidance, multiple evaluations).

(1) Pre-class activities

The English curriculum standards for primary and secondary schools propose to bid farewell to the traditional emphasis on grammar and vocabulary teaching and transmission and instead start with students' interests, cognition, and information characteristics, that is, to clarify the core goal of English teaching: to cultivate students' comprehensive language application ability.

In addition, based on the previous analysis of the problems and reasons for the integration of information technology and English courses in China, this model points out
that before teaching, course teachers and educational technology teachers, respectively, analyze the learning ability, cognitive ability, and information literacy of learners.

Establishing heterogeneous collaborative groups for class students based on non-intellectual factors of students, group learning avoids individual learning loneliness, reduces students' anxiety, and increases their communication activities in the classroom, establishing a common goal of improving language application ability. Before opening each topic, the teacher raises questions based on the teaching content. Students can independently or in groups collaborate to learn on the school learning platform and upload relevant materials (audio-visual combination), and by answering the questions, identify deficiencies and questions.

(2) Classroom implementation
High-quality input to alleviate teaching pressure
Practice makes perfect "is the view held by second language learners, who believe that as long as they practice repeatedly for a long time, they can acquire the target foreign language.

The famous language educator Krashen (1974–2021) believes that traditional "mechanical exercises" cannot smoothly assist in acquiring a second language and require meaningful learning in various aspects, such as the teaching syllabus and content (cited in Chen, 2022).

After students have self-learning and collaborative learning to answer questions, teachers can provide personalized feedback based on statistical questions. At this point, the common problems in the class and students' thirst for knowledge become the integration point, and teachers use this to create targeted microcourses (pieces).

Our excellent course teachers and educational technology teachers collaborate to complete the teaching videos, making them professional and designed and alleviating the teaching pressure of some young teachers, effectively utilizing classroom time.

Group collaborative exercises to increase classroom communication activities
As a linguistic course, foreign languages not only include linguistic knowledge but also application skills and cross-cultural understanding. The traditional classroom and evaluation methods nowadays focus on the accumulation of linguistic knowledge. In the classroom, curriculum teachers advocate for the transmission and understanding of knowledge, often resulting in a "mute classroom".

English teaching expert Harmer pointed out that the three basic elements of a successful foreign language classroom are engagement, study, and activation. To stimulate students' interest in communication and provide them with opportunities for full expression, this model believes that refined and excellent videos help attract students' attention in class and engage them in each new lesson.

In each class, the teacher selects topics to engage in effective dialogue and excellent demonstrations with students, helping them identify excellent vocabulary and phrases in this class and forming a cognitive understanding of effective communication among students in the next stage. Collaborative groups conduct innovative exercises based on demonstration videos to acquire a second language. Shorthand training refers to students learning how to use shorthand while observing, quickly recognizing new vocabulary, pronunciation, and sentence structure from model discourse, selecting central vocabulary, paragraph meanings,
etc., adding language materials for group exercises, and avoiding awkward situations in classroom group exercises.

(3) After-class activities
Theme essay output
Writing is a written form of oral expression, and when there is a lack of communication environment, writing is one of the ways to improve expression skills. When face-to-face communication simulation exercises cannot be conducted after class, written forms can effectively alleviate this problem. Through shorthand training in class (each student prepares a soft notebook to record excellent vocabulary and main ideas presented in high-quality videos and teacher-student dialogues through listening), students choose vocabulary related to this topic for written description and upload it to the personal learning space of the school learning platform according to the theme.

Individual guidance and inter-group evaluation
The course teacher provides specialized guidance on their compositions and oral communication in class, while other team members or classmates in the class make evaluations and expectations regarding classroom communication performance and compositions. Diverse evaluation methods help teachers learn to have a multidimensional understanding of students and are also beneficial for teachers and students to reflect on themselves through developmental evaluation, continuously improving their teaching and learning abilities.

Central idea
(1) Curriculum teachers actively communicate with educational technology teachers.
The 21st century is an era of informationization, and information literacy helps to enhance the professional development of teachers. Curriculum teachers should actively develop their own professional abilities in the curriculum while also participating in professional training and learning to use information technology to help solve problems that are difficult to solve in traditional classrooms, such as audiovisual technology, which benefits students' intrinsic learning motivation.

(2) Identify the integration points of the curriculum and grasp the characteristics and objectives of the curriculum.
In the era of rapid development of computers and networks, English educators are constantly changing their teaching concepts, promoting the integration and development of educational technology and English courses, and promoting the normalization of CALL from assistance. Of course, it should also be recognized that computer network teaching is a supplement and extension of traditional classrooms, and classroom teaching plays a major role in teacher training, teaching by example, and establishing teacher-student relationships.

Wu et al. (2023) proposed implementing the integration of information technology and curriculum; improving the information literacy of teachers and students is one of the curriculum goals, but optimizing learning and improving teaching quality are the main goals of curriculum integration. As frontline educators, we should establish a correct awareness of integration, understand that integration does not mean technology, let alone simple PTT courseware and microcourses, and avoid integration for the sake of integration. Instead, we
should search for integration points based on the characteristics of course content and use information technology for effective teaching.

(3) Reasonably utilizing autonomous learning and collaborative learning.

Middle school students' existing self-learning ability allows them to independently solve some of the learning tasks assigned by teachers. According to Erikson's Eight Stage Theory, high school students are currently in their fifth stage, and the main event of development is peer interaction. Reasonable collaborative methods can lead to better academic performance and quality of learning (John & Johnson, 2008), promoting greater mutual care, support, and closer relationships among learners (Mattingly & Van Sickle, 1991, cited in Tang, 2023). Teachers should determine the tasks that students independently complete and group collaboration tasks based on task difficulty, resource acquisition difficulty, and students' cognitive level.

(4) Establishing a diverse evaluation mechanism to promote reflective teaching among teachers and students.

In the context of the reform of the college entrance examination, students have various learning psychology issues and anxiety towards English learning. Anxiety can affect high school students' listening skills (Fu, 2005; Chen, 2005), reading skills (Shi, 2004), speaking skills (Lu, 2023), writing skills, and overall academic performance (Zhang, 2004; Tang, 2005). Teachers should conduct sufficient learner and textbook analysis, choose appropriate teaching strategies, and develop diverse evaluation methods to avoid learning anxiety and slack in the evaluation mechanism.

(5) Issues to pay attention to in middle school English teaching in the era of Big Data

- The integration of information technology with English teaching is not deep enough, and there is room for expansion in the application level of information technology.

The combination of information technology and English teaching has improved the efficiency of English teaching and further improved students' learning abilities. However, in many high schools, the combination of information technology and English teaching is not perfect, and there is still great room for expansion.

Mainly manifested in the following aspects: there is no effective connection between online and offline learning, and further improvement is needed in terms of learning content, learning time, evaluation, and teaching management; There is still room for the use of big data analysis systems and personalized learning for middle school students to implement individualized teaching. The ubiquitous learning environment has not yet been implemented. The data update and flow speed of big data technology is extremely fast. Many times, due to the lack of timely analysis and utilization, the data becomes outdated and ineffective, losing its utilization value.

- The educational technology ability of English teachers needs to keep up with the development of the times.

The era of big data poses challenges to the educational technology capabilities of English teachers. In this era of information explosion, knowledge intensiveness, and continuous development of information technology, the educational technology capabilities of the past are insufficient to meet the needs of teaching in the era of big data. With the development and widespread application of information technology, the technological means of foreign language teaching are constantly updating and changing.

From the earliest broadcasting and audiovisual to language laboratories to the popularization of the Internet and big data, technological updates are constantly changing.
In this scenario, the demand for teachers' educational technology capabilities is constantly increasing. Teachers, like students, need to constantly learn and improve, master educational technology knowledge, and keep up with the development of the times.

For example, we should have a deep understanding and mastery of basic knowledge in the era of big data, such as mobile Internet, Internet of Things, Internet Plus, cloud computing, etc. Has the ability to accurately retrieve information and conduct information-based teaching; is proficient in applying skills related to data analysis, data processing, and management.

- Full reliance on big data in English teaching decision-making.

The development of big data technology undoubtedly promotes the development of English teaching and provides strong technical support for English teachers and students to make decisions in the teaching and learning process. However, relying solely on big data for teaching decision-making also has some problems.

The main results of big data analysis are usually related, not causal, which can have adverse effects on the teaching decisions of teachers and students. 'Everything can be quantified' is just our wish. In fact, not all information can be digitized, which can lead to deviations in our teaching decisions.

In addition, data only has value when it contributes to our goals, so we need to learn how to make choices to achieve data value.

**Strategies for dealing with middle school english teaching problems in the era of Big Data**

(1) Establish an intelligent big data teaching environment and deeply integrate it with English teaching.

In order to improve the level of foreign language teaching in the era of big data, it is necessary to build an intelligent information environment for foreign language teaching. We need to build a big data platform with high compatibility and accessibility in high schools so that multimedia classrooms, computer rooms, laboratories, libraries, reference rooms, and data resources between various departments can be interconnected. At the same time, various data transmission and resource sharing can be achieved, changing the situation of independent division within the campus. At the same time, it is necessary to build an information technology environment that connects high schools, social education institutions, and various types of the internet.

Through the construction of an intelligent information environment on and off campus, ubiquitous learning can be carried out, achieving the interconnection and integration of online and offline learning. Strengthen the design, supervision, and guidance of students' English learning processes. For example, using MOOCs, microcourses, and flipped classroom teaching methods, students' online learning process can be mastered through big data technology, and problems and difficulties encountered in their learning can be identified and solved in a timely manner through offline classrooms.

Conversely, problems encountered offline by students can also be solved online. We need to strengthen students' autonomous learning and make full use of mobile communication tools to maximize the utilization of fragmented learning time. We should pay attention to students' learning strategies and methods, analyze them in a timely manner through big data technology, and provide accurate guidance to students.
We should apply different teaching strategies based on different learning characteristics, break the homogenization of education methods, and solidly achieve individualized teaching. To adopt a diversified and comprehensive evaluation of students' learning, big data technology should be used to comprehensively consider various elements of learning, progress, and development, combining formative evaluation and summative evaluation.

We should quickly respond to the teaching data provided by big data technology, analyze it at any time, and strive not to miss out on valuable information to guide students' learning. When using data, it is important to have a deep understanding of the important connotations hidden behind big data analysis results and adjust teaching strategies based on actual situations. Teachers and management personnel need to maintain communication and tacit cooperation. Teachers should provide feedback on the analyzed data to management personnel, and management personnel should implement new management systems and measures based on the new characteristics of teaching and learning to ensure the smooth application of big data technology in teaching practice.

(2) Improve teachers' educational technology capabilities in all aspects.

To adapt to English teaching in the context of the big data era, teachers need to pay attention to several aspects: the application of teaching technology and methods, the interpretation of teaching content and resource construction, teaching organization and control, asynchronous teaching management, testing and research, and the creation of a teaching environment. The above aspects all involve improving teachers' educational technology capabilities, and improving educational technology capabilities can be achieved through the following aspects:

First, there should be a strong awareness of the development of educational technology, recognizing the enormous role of educational technology in the development of English teaching. The development of educational technology has changed all aspects of English teaching. For example, in the era of big data, it is important to recognize that the promotion and popularization of big data technology have profoundly changed our learning methods. As online learning gradually becomes the main way for students to acquire knowledge, traditional courses have played a role in assisting teaching. At the same time, we need to change our resistance and fear of complex educational technologies, believing that as long as we study hard, we will master and apply them and actively accept learning.

Secondly, corresponding development goals for educational technology capabilities should be formulated. This goal can be based on the requirements of the school and the development situation of the teachers themselves. At the same time, it can also refer to the development plans of peer teachers, comprehensively consider them, and formulate practical and feasible scientific development goals that are suitable for the personal situation of foreign language teachers.

Thirdly, we should actively seek ways to improve our educational technology capabilities. Once again, it is necessary to set up research projects for foreign language teachers that are combined with educational technology based on actual situations, encourage foreign language teachers to actively participate, and make them familiar with and understand relevant educational technologies in scientific research. In addition, we need to build an academic circle of cooperation and mutual assistance through timely communication, both online and offline, to exchange our own difficulties and solutions.
At the same time, we can also explore popular issues, consult experts on the latest developments in educational technology, avoid the pressure of working alone, and achieve mutual help and learning. Finally, it is important to cultivate the habit of active reflection. Through teaching practice, foreign language teachers should constantly review their teaching, summarize achievements, identify shortcomings, and form their unique teaching experience and theory through reflection.

Fourthly, we should actively encourage teachers to develop their own educational technology level. Regular assessments and competitions of educational technology skills can be used to recognize and reward outstanding foreign language teachers. Through these methods, advanced and backward English teachers can be encouraged, ultimately promoting the common improvement of their educational technology skills.

(3) In the era of big data, scientific teaching decisions need to be made.

Big data technology provides great convenience for decision-making in the teaching process. Big data technology has saved a lot of valuable time for teachers and students, improved decision-making efficiency, and freed them from the complex decision-making process. Faced with a myriad of data, as long as you master simple big data analysis techniques, you can search, compare, and analyze various learning behavior data left by students online, identify the connections between various learning stages of students, and help make teaching decisions.

The conclusions drawn from big data are true and valuable, and the teaching decisions made through its guidance are more objective and rapid than those solely based on experience. However, due to the limitations of big data technology, like any other technology, we cannot rely solely on big data for decision-making but also on human analysis.

Firstly, the results of big data analysis are usually only related relationships, which themselves have a certain degree of ambiguity.

Therefore, if you want to make scientific decisions, you need to spend time further exploring the causal relationships beneath the related relationships.

Secondly, the significance of data lies in its contribution to our goals. To achieve their own value in big data, decision-makers need to have a strategic vision and the ability to process data. In addition, due to the diversity and complexity of people, many things cannot be quantified as data, so simple big data analysis results are often not comprehensive.

Therefore, although big data has the characteristics of efficiency and real-time, it cannot solely rely on the results of big data.

Data cannot completely replace human thinking, and experiential teaching analysis by teachers is also essential. Quantitative and qualitative analysis should be combined, and teacher analysis should be combined with big data analysis to ultimately make scientific teaching decisions.

Conclusion

The promotion effect of big data technology on college English teaching is obvious. Educators need to fully integrate big data technology with college English teaching, update teaching concepts, keep up with the times, and make a huge leap in the development of college English teaching. At the same time, it is also important to pay attention to human analysis results when using big data and to combine big data technology with teachers'
practical experience to achieve the best results and achieve our teaching ideals. The object of education is students, and the teaching activities in the classroom are mainly activities and communication processes between educators and learners.

This requires that the teaching process first consider the level of differences between learners, that is, respect the individual differences of students. Based on existing guidance, analyze the differences in the degree to which students can achieve problem-solving through the educators' own abilities.

Through the abundance of educational resources, learners can find suitable learning methods based on their actual situation and carry out targeted learning activities on this basis.

In English teaching, there is a high level of emphasis on individualized teaching. If language teaching does not meet the basic level of educators, it will lead to the dampening of learners' learning enthusiasm, deviation from teaching activities, serious gaps, and failure to achieve the original teaching objectives.

Therefore, it is necessary to combine the learning and learning efficiency of the educated, improve teaching activity methods, teach students according to their aptitude, and promote every educated person to achieve success and improve learning effectiveness.

In summary, the application of big data is the mainstream development trend, and its application in English teaching can help improve the shortcomings of traditional English teaching models, further integrate online education resources, provide students with a convenient and relaxed learning environment while learning knowledge, cultivate good self-learning ability and learning literacy, and contribute to the comprehensive development of students' English comprehensive application ability.

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AN ANALYSIS OF RECENT STUDIES IN ENGLISH


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