# Exploration of Interactive Models in Primary School English Classrooms in the Digital Age

**Yanling Wang**
The Primary School of Lanzhou Branch, Chinese Academy of Sciences, Lanzhou, Gansu, China

**Abstract:** With the rapid development of digital technology, the digital age has penetrated into the education sector, especially for English teaching in primary schools. The application of digital technology has enriched teaching activities. This article analyzes the theoretical framework, opportunities, and difficulties faced by primary school English classroom interaction in the context of digitalization, and analyzes the shortcomings of the current interaction mode, proposing improvement measures. It is pointed out that although digitalization provides abundant resources and diversified interactive methods for English teaching interaction, problems such as teachers' varying levels of mastery of digital technology, overly single interactive modes, and technical barriers still remain prominent. Enhancing teachers' understanding and application ability of digital technology, integrating diverse digital tools to broaden interaction channels, improving the supervision and evaluation system of interaction, and solving technical problems are the core strategies to improve interaction effectiveness.

**Keywords:** Digitalization; Primary school English; Classroom interaction; Optimization strategy; Teaching resources

## 1. Introduction

Driven by the digital wave, the education sector is undergoing a transformation from traditional to modern teaching models. In primary school English teaching, exploring how to integrate digital technology to enhance classroom interaction is particularly important. Interactive teaching is widely recognized for its ability to stimulate students' enthusiasm and thinking skills, and the use of digital tools has brought rich and diverse possibilities for this interaction. However, in the practice of interactive teaching of primary school English in the digital environment, there are still problems such as uneven digital technology abilities of teachers, limited interactive methods, and the existence of technology itself. This article explores how to improve the classroom interaction mode of primary school English in the context of digitalization, providing new references for educators.

## 2. Theoretical Basis for Interactive Modes in Primary School English Classrooms in the Digital Age

### *2.1 Interactive Teaching Theory*

Interactive teaching occupies a central position in contemporary educational theory, advocating for active communication and cooperation between teachers and students, as well as among students themselves, in the classroom environment. Teaching theory firmly believes that the educational process should not be a single output of teachers, but should utilize rich interactive forms to stimulate students'

thinking ability and language expression desire, and promote the construction of knowledge. Classroom interaction can be achieved through diverse means, including direct communication between teachers and students, collaborative discussions between students, and interaction between students and textbooks and teaching environments. Interactive teaching emphasizes the imparting of knowledge and focuses more on improving students' abilities, especially in the field of language teaching, which is regarded as a key way to enhance students' language expression, listening comprehension, and comprehensive application skills. With the development of digital technology, interactive teaching has also undergone new developments. The integration of digital technology has made interactive methods more diversified, such as interactive smart boards, online teaching platforms, and the application of intelligent teaching systems, making classroom interaction more flexible and diverse.

### *2.2 Constructivist Learning Theory*

The constructivist learning theory advocated by scholars such as Piaget and Vygotsky states that knowledge is formed through the active participation of learners in the process of construction. The theory advocates that learning is not simply about absorbing knowledge, but about building new understandings through interactive communication, reflection, and practice based on students' existing foundations. In terms of language learning, learning from a constructivist perspective is the process in which students gradually acquire language rules through communication and interaction. In primary school English education, constructivist teaching theory emphasizes the subject status of students and advocates that students actively discover the essence and application of language through collaborative learning, problem exploration, and other means. In today's rapidly developing digital technology, constructivist learning has received new impetus. Teachers can use various technological tools to create highly interactive and contextualized teaching scenarios, allowing students to acquire language in a simulated language environment. For example, through interactive activities such as online platforms, forums, and role simulations, students can practice English in practical applications and enhance their language thinking and logical expression abilities in communication [1].

### *2.3 Digital Learning Theory*

With the advancement of information technology, digital learning theory is gradually emerging, and its core lies in highlighting the supportive function of technology in the learning process. This model breaks the time and space boundaries of traditional teaching, allowing students to enjoy a more flexible and personalized learning process through multimedia resources and online platforms. Online platforms have increased the interactivity of learning and enabled students to independently control their learning pace. In the field of primary school English teaching, digital means provide students with a vast amount of teaching resources, such as online vocabulary learning systems, interactive listening training, and oral practice applications. Teachers can also use intelligent evaluation systems to track students' learning outcomes. The theory of digital learning advocates the use of diversified sensory learning methods to ignite students' learning enthusiasm, improve their learning initiative and participation. In the context of digitalization in primary school English teaching, teachers can use various digital tools and platforms to enrich classroom interaction and improve teaching quality, allowing students to obtain more learning opportunities through active participation and enhancing

their comprehensive language proficiency.

## 3. The Opportunities Brought by the Digital Age for Interaction in Primary School English Classrooms

### *3.1 Abundant Digital Teaching Resources*

In the context of the digital age, primary school English teaching has received abundant resources, which provides a broad space for teachers to carry out innovative teaching [2]. The previous teaching model relied on paper textbooks and oral lectures, but with the integration of digital teaching resources, this situation has changed, and teaching materials and methods have become more diversified. The widespread application of online courses and electronic textbooks has brought students a wealth of learning materials, including text, as well as various media such as sound, images, and dynamic videos, enhancing their enthusiasm for learning. Students can enhance their language comprehension and application abilities by watching original English movies and TV shows, practicing listening skills, and participating in online interactions in a language environment that is close to reality.

Numerous English learning platforms provide customized teaching content based on students' learning status and ability level. These online education platforms can intelligently push topics and training that match students' learning stages and abilities, ensuring that students can learn at appropriate difficulty and pace, and enhancing learning effectiveness. Online teaching resources demonstrate a high degree of flexibility and reusability, allowing students to access learning materials at any time according to their individual learning needs, facilitating review and strengthening memory. This learning mode, which is not limited by time and location, enhances the freedom and self-management ability of learning.

### *3.2 Diversified Interactive Technology Means*

With the continuous development of the digital age, the interaction between teachers and students in primary school English teaching can be facilitated by numerous high-tech means, which enrich the interaction mode, enhance flexibility, and increase students' learning participation. The following table lists several commonly used interactive techniques and analyzes their characteristics and applications.

**Table 1:** Analysis of Digital Interactive Technology Means and Their Applications.

| Technical Means | Application Methods | Interactive Form | Advantages |
|---|---|---|---|
| interactive whiteboard | classroom content display, student answering questions | teacher-student interaction, student activities | intuitive display, enhancing students' sense of participation |
| learning management system (LMS) | homework publishing, discussion area, feedback | student discussion, homework evaluation | real-time feedback, convenient for students to learn independently |
| online classroom platform | video teaching, real-time interaction, post class review | video conferencing, instant Q&A | flexible learning and enhanced classroom interaction flexibility |
| English learning app | vocabulary training, listening training | students' self-study, interactive games | inspire learning interest and provide personalized learning paths |

Observing Table 1, it can be observed that various interactive technologies, based on their characteristics, are suitable for various teaching environments and have unique advantages. Injecting new vitality into classroom communication, breaking the traditional one-way communication mode between teachers and students, making interactive forms more diverse and in-depth, and improving students' learning enthusiasm and teaching effectiveness. By utilizing these technological tools, teachers can carefully plan classroom interactive activities and quickly optimize teaching plans based on real-time feedback from students, achieving personalized and tailored teaching goals [3].

### *3.3 Expanded Interactive Space and Time Dimension*

The arrival of the digital age has changed the way classrooms interact and expanded the spatial and temporal dimensions of interaction, making the boundaries of classroom teaching wider. In previous teaching models, communication between teachers and students was limited to the time and spatial framework within the classroom, and students could only communicate with teachers and peers during designated class hours. However, the integration and application of digital technology have broken through these limitations, realizing the extension of interaction beyond the classroom, greatly expanding the scope and time limit of interaction. Digital teaching tools enable students to participate in interaction at anytime and anywhere. Students can not only communicate in class through advanced technical means, but also maintain continuous interaction with teachers and students after class through Internet learning platforms, social networks and other channels.

Education digital platforms, such as Learning Management Systems (LMS) and online teaching systems, create a place for students to learn and communicate after class. Here, students can browse teaching resources, submit assignments, join topic discussions at any time, and communicate face-to-face with teachers and other classmates through video conferencing systems. With the advent of the digital age, the time limit for communication has been broken. Compared to traditional teaching environments, classroom interaction is limited to the teacher's teaching period, and students participate within a limited time. Digital learning platforms support both synchronous and asynchronous interaction modes. The so-called synchronous interaction refers to the ability of students to immediately raise questions or participate in online discussions during live teaching by teachers, achieving instant communication. Asynchronous interaction allows students to maintain communication and discussion with teachers and classmates through forums, emails, video materials, and other means after class. This interactive form increases the freedom and coherence of learning, ensuring that students can participate in learning activities and communication at any time.

## 4. Current Status of Interactive Modes in Primary School English Classrooms in the Digital Age

### *4.1 Uneven Digital Literacy of Teachers*

With the continuous integration of digital teaching methods, the digital literacy of primary school English teachers has become particularly crucial. At present, teachers' mastery of digital technology varies greatly, which affects the quality of classroom teaching interaction. Some teachers lack professional digital technology training, are not proficient in using teaching software, and even fail to organically integrate digital resources with classroom teaching. Even though schools provide numerous advanced digital devices and resources, teachers have not been able to effectively utilize them and still adopt traditional teaching methods, which has affected the effectiveness of classroom

interaction. Although some teachers have some mastery of digital skills, their application of technology is still limited to the basic level, only using individual tools for teaching, lacking comprehensive application and innovative practice of multiple tools. This situation restricts the richness and diversity of classroom interaction, resulting in a relatively monotonous learning experience for students and a failure to fully utilize the advantages of digital resources. Although some teachers have some understanding of the application of digital tools, they have not done enough in evaluating their teaching effectiveness and reflecting on it. They have not optimized interactive strategies and teaching methods based on students' responses, and the classroom interaction effect is not ideal.

### *4.2 Unifying Interactive Modes*

Although digital methods are gradually becoming popular in teaching, the English classroom interaction in many primary schools is still relatively rigid. The common interaction methods still focus on teacher centered teaching and simple feedback from students, with student interaction limited to basic questioning and answering, lacking diverse participation methods. Some teachers have attempted to use digital devices to promote interaction, such as online testing, smart whiteboards, etc., but most of these devices are still limited to traditional knowledge imparting and evaluation, and have not effectively mobilized students' enthusiasm and creativity, resulting in classroom interaction mostly being in a passive receiving and participating state. Some schools have added numerous digital teaching devices, but teachers have not implemented flexible interactive plans based on students' actual needs and interests, resulting in a lack of change in classroom teaching. For example, in English learning classes using tablets, student interaction is limited to a few individual responses and lacks collective participation from the entire class. In teaching activities that require group discussions, role-playing, or scenario reproduction, many teachers are not proficient enough in interactive strategies or the use of technical equipment, and fail to construct appropriate interactive scenarios. As a result, the actual effectiveness of classroom interaction does not meet the expected goals [4].

### *4.3 Lack of Effective Monitoring and Evaluation Mechanisms*

In the digital teaching environment, the quality of classroom teaching interaction is influenced by teachers' teaching strategies and technological proficiency, while also relying on sound monitoring and evaluation mechanisms to ensure it. At present, primary school students in China generally face the problem of imperfect monitoring and evaluation mechanisms in the learning process of English classrooms, which affects the evaluation and optimization of interactive effects. Some schools have started to adopt teaching aids such as Learning Management Systems (LMS), but many teachers are still unable to proficiently use these systems for real-time classroom supervision and data analysis, as they cannot accurately track students' learning dynamics and participation levels, making it difficult to achieve the goal of improving the quality of classroom teaching interaction. The conventional teaching evaluation model still has a great influence, and many educators still tend to evaluate students' learning effectiveness through oral questioning, homework, and testing, ignoring the observation of students' behavior and emotional attitudes in the communication process. In classroom interactive assessment, it is often only tested whether students can respond to questions, without giving sufficient evaluation attention to aspects such as students' thinking process, emotional expression, and teamwork ability during interaction. This makes it difficult for teachers to have a comprehensive grasp of students'

learning status and make precise adjustments to students' teaching strategies based on the assessment results.

### *4.4 Technical Malfunctions and Network Issues*

Digital technology has brought rich tools and platforms for classroom communication, but technical failures and network issues are still urgent problems that need to be solved in primary school English teaching at present [5]. The facilities and network architecture construction of many schools present an unbalanced state. Some schools, although equipped with advanced digital facilities, face problems such as unstable network connections and outdated equipment. This situation leads to frequent equipment failures in teaching activities, such as network connection failures, system crashes, or device startup failures, which interfere with the normal operation of the classroom. The malfunction of technology affects the teaching pace of teachers, interferes with the coherence of students' learning, and weakens the effectiveness of classroom teaching interaction. The excessive dependence of teachers and students on digital technology in some schools makes it difficult to sustain teaching activities once equipment malfunctions occur, and students' proactive learning attitudes may also suffer setbacks. Especially in classroom scenarios of group collaboration or real-time communication, technical difficulties may cause delays in information exchange, affecting students' participation and learning outcomes. Due to some teachers not fully mastering the contingency skills for dealing with technical failures, it is difficult to take immediate measures when encountering sudden equipment or network problems, which affects the coherence of classroom teaching.

## 5. Optimization Strategies for Interactive Modes in Primary School English Classrooms in the Digital Age

### *5.1 Enhancing Teachers' Digital Literacy*

In today's digital age, teachers' digital technology capabilities play a decisive role in the quality of classroom interaction. Enhancing teachers' digital technology capabilities has become a key way to improve the interactive methods in primary school English classrooms, with specific strategies shown in Figure 1. Schools should regularly organize technology improvement courses to help teachers become familiar with the basic use and functionality of various digital technology tools. For example, through these trainings, teachers can master the operation of interactive electronic whiteboards, online teaching platforms, and various teaching applications, enhancing their ability to apply digital technology. This helps teachers plan more effective interactive teaching plans and also increases their confidence in using digital technology tools in the classroom.

The digital literacy of teachers is reflected in their proficient use of technology, and more importantly, their profound grasp of digital teaching concepts. Teachers should recognize the core value of digital tools, understand that these tools can arouse students' learning enthusiasm, and promote the development of personalized education. Schools should arrange professional training to assist teachers in mastering educational technology theories and guide them to effectively integrate digital technology into teaching objectives, strategies, and classroom management. Teachers need to regularly review and reflect on the effectiveness of digital tools in classroom teaching, and optimize teaching methods accordingly. Teachers also need to cultivate the theory and skills of lifelong learning, and maintain attention and interest in emerging educational technologies. With the rapid advancement

of digital technology, emerging educational tools and platforms are constantly emerging. Teachers should grasp the forefront of technology and new trends in education through various channels such as participating in online learning communities, seminars, and educational technology exhibitions, and continuously improve their digital literacy.

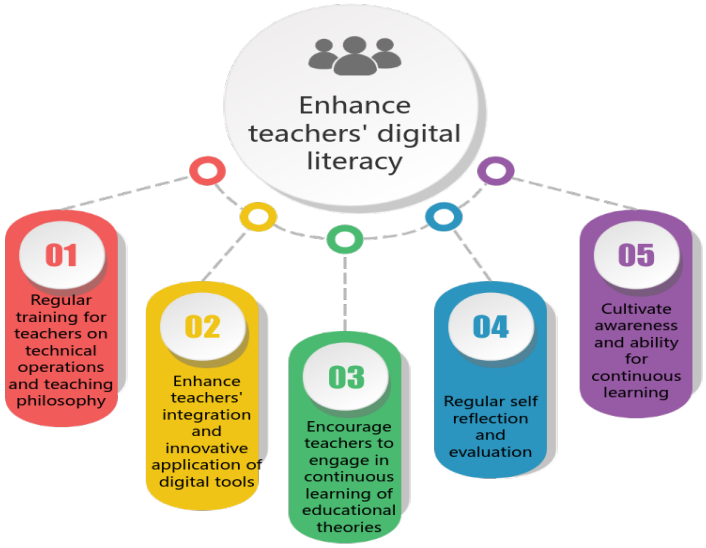


**Figure 1:** Enhancing Teachers' Digital Literacy.

### *5.2 Combining Multiple Digital Tools to Achieve Diversified Interaction*

In order to enhance classroom interactivity, teachers need to integrate various digital tools and create rich and diverse forms of interaction. Teachers can utilize digital educational resources, such as interactive electronic whiteboards and teaching management systems (TMS), to achieve real-time classroom display and communication. For example, electronic whiteboards support direct classroom interaction between teachers and students by touching the screen. Teachers can flexibly adjust teaching materials based on students' real-time feedback, enhancing students' participation and interactive experience. The teaching management system can provide diverse functions such as online homework, online exams, discussion forums, etc., making it easy for students to communicate with peers and teachers outside of the classroom. Meanwhile, a model can be adopted to measure the effectiveness of student interaction, which includes multiple factors such as interaction frequency, student participation level, and tool usage frequency. The following is a mathematical formula that expresses the relationship between student learning outcomes and the use of interactive tools:

$$E = \frac{\sum_{i=1}^{n} (P_i \times T_i)}{F \times D} \tag{1}$$

In Formula (1), $E$ represents the learning effectiveness of students, $n$ represents the number of digital tools, $P_i$ represents the participation level of the $i$-th tool (such as the time or frequency students use the tool), $T_i$ represents the interaction quality of the $i$-th tool (such as the depth of interaction, feedback, etc.), $F$ represents the total learning time of students, and $D$ represents the difficulty coefficient of the learning content. This formula can quantitatively evaluate the effectiveness of various digital methods in classroom interaction and explore their specific impact on students' academic outcomes.

Using multiple digital tools to implement personalized teaching is an effective way to promote diversified classroom interaction. Teachers can assign customized learning tasks and materials based on students' personalized learning curves and interests, using online teaching platforms to meet the learning needs of each student. For example, using English learning software for word memory and listening improvement can allow students to maintain interactivity during self-study and monitor their learning progress in real time. Teachers can also communicate with students after class through social media, email, and other means, initiate discussion topics, and motivate students to exchange learning experiences and insights. This way, students can actively participate in interactions in class and maintain communication with classmates and teachers after class, enhancing the coherence of learning [6].

### *5.3 Establish and Improve Monitoring and Evaluation Mechanisms*

In the era of digital teaching, it is crucial to establish a sound monitoring and evaluation mechanism to ensure the quality and effectiveness of interactive teaching. Schools should assist teachers in building a teaching supervision system that relies on digital tools. By using the Teaching Management Platform (TMP), teachers can instantly grasp students' learning dynamics, observe their participation in interactive activities, and complete assignments and quizzes. Enable teachers to quickly identify students' learning disabilities, optimize teaching methods based on feedback, and implement customized educational programs.

Traditional teaching evaluation focuses on students' oral expression ability, neglecting their comprehensive skills in the communication process. Teachers can integrate electronic assessment tools, such as online testing, video recording, and classroom communication, to implement comprehensive and three-dimensional assessments. The evaluation object should not be limited to individual students, and the effectiveness of classroom communication should also be taken into consideration. By evaluating communication and interaction, teachers can grasp students' level of mastery and interests in teaching materials, and optimize teaching methods and plans in a timely manner. Building a self-evaluation system for students is equally crucial for improving communication quality. Students can use self-assessment and peer evaluation to deeply reflect on their learning process and classroom performance, and propose improvement suggestions. This method helps students to have a clearer understanding of their strengths and weaknesses, and also promotes their active participation and self-motivation in classroom interactions.

### *5.4 Equip Professional Technical Personnel to Promptly Solve Technical Problems*

To ensure the smooth use of digital teaching tools in the classroom, schools need to equip professional technical maintenance personnel to address potential technical barriers and networking difficulties. The school needs to establish a dedicated technical support team to undertake the routine maintenance of teaching equipment and the smooth operation of network systems. Technicians need to ensure that teaching equipment is in good working condition, and regularly review and upgrade software systems to maintain the synergy and efficient operation of classroom teaching technology tools [7].

When teachers frequently encounter hardware failures or unstable networks while using digital teaching aids, the lack of necessary technical assistance may lead to the forced suspension of teaching

activities. It is necessary for teachers to learn some basic troubleshooting skills, such as restarting devices, verifying network status, etc., to reduce the interference of technical problems on the teaching process. Teachers should also master the method of quickly contacting the technical support team, providing timely feedback on fault situations, and enabling problems to be dealt with quickly. Schools should consider providing backup teaching equipment or developing technical backup plans for teachers. When there is a problem with the main equipment, teachers can immediately switch to backup equipment to ensure the continuity of teaching activities. Schools also need to regularly inspect and maintain teaching technology equipment to ensure its continuous and reliable operation. Building a complete technical support system can help schools create a stable teaching atmosphere for teachers and ensure that digital tools can be smoothly put into use.

## Conclusion

The digital age has brought unprecedented opportunities and new challenges to primary school English teaching. In this context, the optimization of classroom interaction mode requires teachers to have solid technical literacy, and also requires the joint efforts of educational managers and technical support personnel. Through abundant digital resources, diverse interactive technologies, and expanded interaction time and space, the interactive mode of primary school English classrooms can be significantly improved. However, there are still problems in current practice such as uneven digital literacy among teachers, single interactive methods, and frequent technical issues. Therefore, enhancing teachers' technical abilities, utilizing various digital tools reasonably, improving evaluation and feedback mechanisms, and solving technical problems have become the key to improving teaching quality. In the future, with the further development of technology, the interactive mode of digital classrooms will become more flexible and diversified, which is expected to provide students with richer learning experiences and promote the comprehensive upgrading of education.

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