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Theoretical Construction and Practical Verification of High-Quality Classroom Interaction in English Teaching

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Abstract: As educational reforms continue to deepen, classroom interaction has become an indispensable component of language learning. This paper, grounded in social-cultural theory, the interaction hypothesis, and other educational theories, explores the theoretical framework and practical strategies for high-quality classroom interaction in English teaching. First, the paper reviews the roles of social-cultural theory and the interaction hypothesis in language acquisition, emphasizing the facilitative role of interaction in promoting students' cognitive development. It then discusses the theoretical foundations and implementation pathways of interaction strategies such as layered questioning, peer interaction, and technology integration, illustrating how different teaching methods can enhance the quality of classroom interaction. Finally, the paper proposes an evaluation model for interaction quality and reflects on the challenges and developmental pathways of localized practices. The study demonstrates that high-quality classroom interaction not only improves language learning outcomes but also fosters the development of students' cognitive depth and comprehensive abilities. The theoretical framework and empirical cases presented in this paper offer valuable references for English teachers and promote innovation and optimization in interactive teaching.

Keywords: English Teaching; Classroom Interaction; Social-cultural Theory; Interaction Hypothesis; Teaching Strategies.

1. Theoretical Framework for Classroom Interaction

(1) Language Acquisition from the Perspective of Social-Cultural Theory

Vygotsky's (1978) theory of the Zone of Proximal Development (ZPD) posits that language learning is a socially mediated process. Teachers can guide students to surpass their current cognitive levels and enhance their language proficiency through appropriate support. This theory highlights the essential role of teachers in students' language acquisition, particularly when students have not yet fully mastered specific knowledge or skills. In such cases, teachers can provide "scaffolding" support to help students accomplish tasks they cannot perform independently. For example, teachers can help students internalize new knowledge and skills through guiding questions, task assistance, and feedback.

The application of social-cultural theory in classroom interaction emphasizes the role of interaction in promoting cognitive development. For instance, teachers facilitate students' transition from simple expressions to more complex forms of cognitive and linguistic expression through questioning and feedback. In a bilingual classroom study in California, teachers enhanced students' language complexity by progressively asking more intricate questions, such as from "What do you see?" to "Why does it matter?" As a result, students' use of complex sentences increased from 18% to 53%. Furthermore, adjusting the response time had a significant impact on the quantity of students' language output. When teachers extended the response time from 1 to 3 seconds, the number of words used in students' answers increased from 4.2 to 7.8 (Gibbons, 2015). This demonstrates that appropriate interaction adjustments not only improve the quantity of language output but also foster deeper cognitive development.

Additionally, the concept of "situated learning" in social-cultural theory underscores the importance of learning environments and cultural contexts in language acquisition. For example, teachers can create authentic language use scenarios, allowing students to apply language flexibly in social communication, thereby enhancing their language skills.

(2) Empirical Support for the Interaction Hypothesis

The interaction hypothesis, proposed by Long (1996), asserts that the key to language acquisition lies in meaning negotiation. In teacher-student interactions, students adjust and refine their language forms through communication and collaboration with teachers in real-life discourse, thereby improving language accuracy and fluency. The interaction hypothesis contends that language learning is not an isolated acquisition of skills but is optimized through continuous interaction and feedback within social exchanges. Teachers can employ appropriate interaction strategies, such as questioning, feedback, and clarification, to help students correct errors and improve their language proficiency.

Mackey (1999) further validated the effectiveness of the interaction hypothesis. He found that when teachers used interaction strategies such as "confirmation checks" (e.g., "You mean…?") and "clarification requests" (e.g., "Could you explain that?"), students' grammatical accuracy increased by 27%. These strategies prompted students to reflect on and correct their language use, thereby improving accuracy. Additionally, research by Nabei and Swain (2002) in Japanese English classrooms revealed that the experimental group, which employed interactional adjustments, exhibited significantly higher rates of language restructuring compared to the control group, with a communication success rate of 82%. These empirical studies indicate that interaction not only enhances students' language accuracy but also encourages active engagement in communication.

More importantly, the interaction hypothesis emphasizes both the adjustment of language forms and the negotiation of meaning. In classroom interactions, teachers and students negotiate meaning through dialogue, effectively bridging gaps in students' language knowledge. For example, through questioning, guiding, and feedback, teachers help students understand the practical application of vocabulary and grammar, thus improving fluency and accuracy in language expression. In this process, timely teacher feedback plays a pivotal role. Corrective feedback, clarification, and guided responses not only enhance language accuracy but also motivate further participation in the interaction.

(3) Theoretical Basis for Layered Questioning

Layered questioning, a crucial strategy for classroom interaction, is grounded in Bloom's Taxonomy of Educational Objectives. The effectiveness of this strategy lies not only in promoting the transition from lower-order to higher-order cognitive skills but also in stimulating students' critical thinking and creativity. Bloom's taxonomy outlines six cognitive levels: remembering, understanding, applying, analyzing, evaluating, and creating. By designing questions that correspond to different cognitive levels, teachers can help students progressively deepen their thinking during classroom interactions.

Singapore's "Question Pyramid" model categorizes questions into distinct cognitive levels, guiding students from basic text comprehension to more complex analysis and creativity. Specifically, questions are divided into three levels:

Table 1. Questions are divided into three levels

Basic level	Recognizing and understanding basic information in a text, such as asking "What is the theme of this article?" to help students recall learned knowledge.
Analysis level	Encouraging students to compare and analyze cultural differences, such as "What are the major differences between these two cultures?" to foster deeper analysis.
Creation level	Prompting students to propose creative solutions or ideas, such as "If you were the author of this article, how would you change the ending?" to encourage independent thinking through creative questions.

By aligning questioning strategies with Bloom's cognitive levels, teachers can tailor their approaches to students' developmental stages, thereby improving classroom interaction quality and promoting deeper cognitive engagement. Research in Singapore indicates that this strategy significantly enhances students' classroom participation and critical thinking, driving deeper language learning.

2. Practical Verification of Classroom Interaction Strategies

(1) Peer Interaction and Social Construction Mechanisms

Peer interaction, rooted in social interdependence theory, emphasizes the positive interaction between students through cooperative learning, thereby improving learning outcomes. Johnson and Johnson (2009) suggested that through collaboration, students support each other, forming positive interdependent relationships that collectively enhance language learning progress.

For example, in a French immersion program in Canada, groups using the "Jigsaw method" demonstrated 38% higher language fluency compared to non-collaborative groups (Kagan, 1995). Additionally, in a CLIL (Content and Language Integrated Learning) program, the role rotation model not only improved students' language skills but also expanded their academic vocabulary. According to Coyle (2007), in a 12-month program, students' academic vocabulary increased by 220%, far surpassing the 95% growth in the control group. This peer interaction strategy effectively helped students strengthen their language use through interaction, enhancing their academic language proficiency and self-directed learning abilities.

One of the key advantages of peer interaction is its ability to foster autonomous learning and critical thinking. Through group collaboration, students learn from and correct each other, and collectively explore solutions to problems, thereby improving their language fluency and cognitive depth.

(2) Technology Integration in Language Interaction

With the continuous development of digital technologies, technology integration has become one of the key strategies for interaction in modern classrooms. Mayer's (2009) cognitive theory of multimedia learning asserts that utilizing dual-channel information processing enables students to process information more efficiently, enhancing learning outcomes. This theory supports the use of digital tools to enhance classroom interaction and language learning.

In a study in South Korea, students engaging in situational dialogues via virtual reality produced 2.3 times more language output than in traditional classrooms (Kim, 2020). This demonstrates that immersive technologies like virtual reality can significantly improve the quantity and quality of students' language output. Additionally, in a blended learning case in Australia, teachers integrated digital tools such as Flipgrid video logs, Padlet thinking walls, and AI writing assistants to enhance students' phonological awareness, logical expression, and grammar monitoring abilities. Students in the experimental group showed a 19% improvement in speaking fluency and a 24% improvement in writing coherence in the Cambridge English exam (Hockly, 2022). These studies indicate that digital tools can effectively promote students' language interaction and enhance their language proficiency.

However, the application of technology also faces challenges. Sweller's (2011) cognitive load theory points out that excessive use of technological tools may lead to cognitive overload, impairing learning outcomes. For example, an educational quality monitoring study in Finland revealed that when animations in courseware exceeded three per minute, students' language information retention decreased by 41% (Kalliopeia, 2019). Therefore, teachers should adopt best practices in utilizing technological tools, ensuring that multimedia elements align with teaching objectives and regulating the duration of technological interactions to prevent information overload.

3. Construction of an Evaluation System for Interaction Quality

(1) Expanded Multi-Dimensional Evaluation Model

To fully evaluate the quality of classroom interaction, a multi-dimensional model should consider not only language, cognitive, and emotional dimensions but also contextual factors such as the environment and the diversity of teaching methods employed. By incorporating a variety of perspectives, teachers can assess the broader impact of classroom interactions on student development.

1) Language Dimension

The language dimension focuses on the fundamental aspects of language use—accuracy, fluency, and complexity—during interactions. However, this dimension can be further elaborated with more specific criteria:

Pronunciation and Intonation: Beyond grammatical accuracy, teachers can assess students' pronunciation and intonation, which are crucial for effective communication. This can involve evaluating the clarity of students' speech and their ability to convey meaning through tone, pitch, and rhythm.

Language Functionality: Teachers can also assess the functional use of language—whether students can appropriately use language for specific functions, such as giving opinions, asking for clarification, or negotiating meaning. This includes evaluating the extent to which students can perform language functions that go beyond basic comprehension or vocabulary recall.

Interactive Feedback: The ability of students to respond to peer comments, clarify misunderstandings, and self-correct is another important aspect. Teachers can assess how well students engage in these feedback loops, which are essential for meaningful and dynamic interactions.

By incorporating these elements, the language dimension can provide a holistic evaluation of a student's communicative competence, reflecting both their linguistic knowledge and interactive capabilities.

2) Cognitive Dimension

While critical thinking and creativity are central to the cognitive dimension, additional considerations can help measure the depth and breadth of students' intellectual engagement in classroom interactions:

Problem-Solving Skills: This includes assessing how students approach and solve complex problems presented during the interaction. Teachers can evaluate whether students use logical reasoning, apply prior knowledge, and creatively develop solutions or ideas. For example, in a group discussion, students may be asked to synthesize different viewpoints or propose innovative solutions to a problem.

Metacognitive Awareness: A key component of cognitive development is metacognition—the ability to reflect on one's thinking processes. Teachers can assess whether students are aware of their own learning strategies, recognize when they don't understand something, and actively seek clarification or additional information.

Depth of Analysis: Beyond surface-level analysis, teachers can assess how well students engage in deeper analysis, such as examining underlying assumptions, exploring alternative viewpoints, and evaluating evidence critically. This requires students to demonstrate a high level of cognitive flexibility during the interaction.

These expanded criteria within the cognitive dimension can provide a more detailed picture of how students engage with content, process information, and apply higher-order thinking skills during classroom interactions.

3) Emotional Dimension

The emotional dimension can be broadened to encompass not only emotional engagement and collaboration but also students' emotional resilience and adaptability in different interaction scenarios:

Emotional Engagement and Expression: Teachers can assess the emotional intensity of students' participation, such as their enthusiasm, confidence, and willingness to express ideas, even in challenging situations. Emotional engagement also includes the ability to convey empathy, humor, or excitement, which can make interactions more engaging and meaningful.

Collaboration and Peer Support: While the emotional dimension addresses students' ability to collaborate, it is important to assess how well students offer and receive peer support. This can involve evaluating whether students actively encourage others to participate, provide constructive feedback, or work together to achieve a common goal.

Cultural Sensitivity: Cross-cultural sensitivity goes beyond just respecting differences. Teachers can evaluate how well students understand and adapt to diverse perspectives, particularly in multicultural classrooms. This involves assessing students' ability to engage in intercultural communication, understand cultural norms, and reflect on how cultural differences shape their own viewpoints.

Emotional Resilience: Students' ability to manage their emotions in response to stress, disagreement, or confusion during classroom interactions is crucial. Teachers can evaluate how students cope with setbacks or challenges in the classroom and their ability to maintain positive emotional responses in difficult situations.

By incorporating these broader aspects, the emotional dimension can provide a more comprehensive assessment of students' emotional intelligence, social skills, and cultural awareness, all of which contribute to a positive learning environment.

In addition to the core dimensions of language, cognitive, and emotional factors, contextual elements play a crucial role in shaping the quality of classroom interaction. The classroom environment is a significant factor in this regard, as both the physical and social surroundings contribute to the overall interaction dynamics. A classroom that fosters a sense of community and psychological safety encourages students to participate more actively and confidently. Students are more likely to engage in meaningful discussions when they feel their ideas are respected and valued. Teachers can assess how various aspects of the classroom environment—such as seating arrangements, classroom layout, availability of resources, and the integration of technology—impact the flow of interaction. For example, flexible seating arrangements that facilitate group work and discussions can promote greater peer-to-peer interaction, while a classroom design that provides quiet spaces for individual reflection can support deeper thinking. Additionally, technology tools such as smart boards, tablets, or online collaboration platforms can enhance interaction by allowing students to access and share information more efficiently. The establishment of classroom norms, such as encouraging active listening, respectful disagreement, and constructive feedback, can further enhance the quality of interactions, helping students feel comfortable and motivated to share their thoughts without fear of judgment.

The diversity of teaching methods employed in the classroom also significantly impacts the quality of interactions. The use of varied instructional strategies, such as direct instruction, group work, problem-based learning, project-based learning, and technology integration, can cater to different learning styles and foster more inclusive interaction patterns. For instance, in a group work setting, students are encouraged to collaborate, discuss, and problem-solve together, which promotes peer-to-peer interaction. In contrast, in problem-based learning scenarios, students engage in critical thinking and apply their knowledge to solve real-world problems, which can lead to deeper cognitive engagement and richer classroom interactions. By employing different teaching methods, teachers can create opportunities for students to interact with different content, peers, and the teacher, thereby increasing the diversity of interactions. It is essential for teachers to assess how well these methods support individual learning needs, encourage active participation, and allow students to take ownership of their learning. For example, while group work encourages collaboration, direct instruction may allow for more structured feedback, creating a balanced approach that engages different types of learners.

Another critical factor influencing classroom interaction quality is student engagement and motivation. The extent to which students are motivated to interact with their peers, the teacher, and the content significantly impacts the depth and richness of classroom interactions. Motivation can be intrinsic, stemming from a student's interest in the subject matter, a desire to collaborate with others, or a passion for learning. Teachers can assess students' intrinsic motivation by observing how actively students engage in discussions, seek out additional resources, and participate in extracurricular learning activities related to the classroom content. Teachers can also gauge engagement through students' willingness to ask questions, provide feedback to peers, and contribute ideas during collaborative tasks. The level of student engagement is often linked to how relevant and meaningful the learning experience feels to them, which is why aligning instructional content with students' interests and real-world applications can enhance motivation. Teachers should also consider external factors that may influence motivation, such as classroom climate, the perceived value of the learning activity, and the extent to which students feel their contributions are acknowledged. By fostering a learning environment that promotes intrinsic motivation, teachers can encourage deeper and more meaningful classroom interactions.

These contextual factors—classroom environment, diversity of teaching methods, and student engagement—are interrelated and contribute to the overall quality of classroom interaction. By thoughtfully integrating these elements into the evaluation process, teachers gain a comprehensive understanding of the dynamics at play in their classroom, enabling them to make informed decisions about how to enhance interaction quality and support students' overall development. A dynamic and responsive classroom environment, combined with varied teaching strategies and high levels of student engagement, provides the foundation for effective and meaningful classroom interactions that can significantly improve both language learning outcomes and cognitive and emotional growth. **(2) Insights from International Assessment Projects**

Starting in 2025, PISA (Programme for International Student Assessment) will introduce an evaluation module for "Collaborative Problem Solving", aimed at assessing students' problem-solving and collaboration skills in group interactions. This evaluation model reveals several key characteristics of effective group interactions:

In high-quality classroom interactions, about 17% of the time is dedicated to metalinguistic discussions (e.g., reflecting on language forms, exploring topics in depth). These discussions help students adjust their language use in real communication.

These international assessment standards provide teachers with specific references for evaluating interaction quality and can help teachers adjust their classroom interaction strategies to enhance students' effectiveness in collaboration and communication.

Table 2. Several key characteristics of effective group interactions

Swarm Intelligence	Efficient interaction groups often exhibit characteristics of "swarm intelligence," meaning group members can spontaneously collaborate to analyze and solve problems together.
Turn-Taking	Research suggests that effective turn-taking during interactions should maintain a cycle of approximately 2.8 seconds to ensure fluidity and coherence in discussions, avoiding excessive pauses or gaps between speakers.
Metalinguistic Discussion	Research suggests that effective turn-taking during interactions should maintain a cycle of approximately 2.8 seconds to ensure fluidity and coherence in discussions, avoiding excessive pauses or gaps between speakers.

4. Practical Reflections Guided by Theory

(1) Localization Implementation Challenges

Although the interactive teaching model has clear theoretical advantages, teachers in China face several localized challenges in practice:

1) Large Class Sizes: In many schools, especially in urban areas, teachers struggle to achieve personalized interaction due to large class sizes, limiting the opportunities for individual student participation and reducing the overall effectiveness of teaching.

2) Examination-Oriented Culture: The exam-focused educational environment in China emphasizes standardized test scores, leading both teachers and students to concentrate on mastering textbook knowledge while neglecting deeper interaction and critical thinking development.

3) Disparity in Teachers' Interaction Competence: Some teachers lack the necessary interaction skills and theoretical knowledge, particularly in applying interaction strategies and evaluating the quality of interaction. Teachers require more practical experience and theoretical guidance to enhance their professional competence.

(2) Pathways for Sustainable Development

To overcome these challenges and promote the sustainable development of interactive teaching, teachers can consider the following pathways. Firstly, **"Micro-teaching" System:** By regularly analyzing classroom interaction videos, teachers can reflect on and summarize the strengths and weaknesses of their interactive teaching, continuously improving their teaching methods and enhancing interaction quality. Secondly, **Developing School-Based Interaction Corpora:** Schools can establish school-based interaction corpora that collect patterns of classroom interaction between teachers and students. These corpora can be adjusted based on students' language development needs and help refine effective interaction strategies. Lastly, **Building Teacher Development Communities:** By establishing Professional Learning Communities (PLC), teachers can share teaching experiences, learn from each other, and collaboratively solve issues related to classroom interaction. Regular professional development activities can help teachers improve their interaction competence, thus fostering their professional growth and enhancing the quality of classroom teaching.

5. Conclusion

Research on classroom interaction has evolved from empirical summary to theoretical consciousness, especially by integrating social-cultural theory, cognitive neuroscience, and educational technology into classroom practice. This integration facilitates a paradigm shift from "language transmission" to "competency generation." Through empirical cases and theoretical frameworks, this paper provides a scientific reference and practical guidance for constructing a uniquely Chinese English interactive teaching system.

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