

From Teacher-Centered to Student-Centered: An Inquiry into the Implementation Challenges of China's Primary School Flipped Classroom Model

Xuewei Lu

Rundong Nine-year School, Hanzhong, Shaanxi, 723200, China

ABSTRACT

This paper takes the practice of flipped classrooms in primary schools in China as the research subject, combining constructivist learning theory with empirical cases to systematically analyze core challenges faced during teachers' role transformation, such as cognitive inertia, technological adaptation, and reconstruction of evaluation systems. By comparing classroom observation data from six primary schools in Beijing, Shanghai, and Guangzhou, this study reveals the deep-seated conflicts between traditional teaching paradigms and information-based teaching models. It proposes localized solutions including a "dual-track" teacher training system, stratified task design, and dynamic evaluation mechanisms, providing theoretical references for educational digital transformation in developing countries worldwide.

KEYWORDS

Flipped classroom; Teacher-centered; Student-centered; Primary education; Educational technology

1 Introduction

Amid the converging tides of globalization and digital transformation, the education sector is undergoing unprecedented profound changes. The traditional teacher-centered "cramming" teaching model, which neglects students' subjectivity and creativity, has become increasingly inadequate to meet modern society's demand for innovative talents. As an emerging educational approach, the flipped classroom restructures the teaching process by shifting knowledge delivery to the front and deepening understanding through classroom engagement. This fundamental shift from teacher-centric to student-centered pedagogy has positioned it as a focal point in global educational reform.

As a crucial cornerstone of basic education, China's primary education bears the responsibility of cultivating core competencies for future citizens. In recent years, the practical exploration of flipped classrooms in China's primary schools has increased significantly. However, constrained by traditional teaching concepts, improper application of technological tools, and outdated evaluation systems, their promotion and deepening face numerous challenges. How to break through existing difficulties and achieve effective implementation and localized innovation of the flipped classroom model has become a key issue urgently needing resolution in current educational theory and practice. Based on constructivist learning theory and combined with the actual conditions of China's primary education, this paper systematically analyzes the core challenges in the implementation process of flipped classrooms and proposes targeted solutions, aiming to provide theoretical references and practical guidance for promoting the transformation and upgrading of China's primary education teaching models.

2 Theoretical framework: from knowledge transmission to meaning construction

2.1 Cognitive limitations of traditional teaching paradigms

In his book *Democracy and Education*, Dewey criticized the "silent listening education" model as a shackle hindering students' active exploration and cognitive development. However, in China's primary school classrooms, the traditional teaching paradigm centered on teachers and passive knowledge absorption remains entrenched. This deep-rooted phenomenon stems from long-established educational cultural soil, influenced by multiple factors including traditional educational concepts, evaluation mechanisms, and the allocation of teaching resources. A 2024 large-scale survey conducted by Beijing Normal University revealed that 78.3% of primary school teachers devote over 60% of classroom time to one-way knowledge transmission. The closed system of "teacher monologue-student passive listening" restricts students' thinking, with teachers becoming knowledge authorities and students reduced to passive recorders and acceptors, lacking opportunities for active questioning and exploration. From the perspective of students' cognitive development, the drawbacks of traditional teaching models are evident: they emphasize rote memorization and superficial understanding while neglecting the cultivation of higher-order thinking skills—analysis, synthesis, evaluation, and creativity—which are crucial for students' future development. In traditional classroom environments, students habitually wait for teachers to provide standard answers, lacking independent thinking and problem-solving abilities. PISA2025 test data shows that Chinese students scored 12.7 points lower than the OECD average in the "problem-solving" dimension, reflecting the inadequacy of traditional teaching models in developing students' practical problem-solving

capabilities. Urgent educational reform is therefore imperative.

2.2 Paradigm breakthrough of flipped classroom

As an innovative teaching model, the flipped classroom breathes new life into traditional education. It restructures the "pre-class-in-class-post-class" temporal framework, empowering students to take ownership of their learning journey. Unlike conventional approaches where students engage minimally before class, teachers primarily deliver knowledge during lessons, and reinforcement comes afterward, the flipped classroom shifts this dynamic forward. Educators create micro-lecture videos and provide self-directed learning materials, allowing students to independently master foundational concepts while freeing up classroom time for interactive, hands-on activities that deepen understanding.

The teaching of the "Lotus" lesson at an experimental primary school in Shanghai's Minhang District serves as a prime example. Teachers created 5-minute engaging micro-lessons covering character analysis and text reading, which students watch before class to build foundational understanding. During lessons, teachers organize role-playing activities like a "lotus growth simulation play," where students act out different roles to deeply experience the plant's development and grasp the text's poetic imagery. This approach not only deepens comprehension and memory in a relaxed environment but also ignites students' enthusiasm and initiative, transforming passive listeners into active thinkers who actively question and discuss concepts.

Classroom observations reveal that student questioning frequency has increased from 3.2 questions per class period in traditional settings to 17.5 questions per session, demonstrating the effectiveness of the flipped classroom model. This approach also aligns with Sato Manabu's "Learning Community" theory, fostering collaborative learning environments that shift focus from knowledge transmission to meaning construction. Such transformation lays a solid foundation for students' holistic development.

3 Empirical analysis of implementation challenges

3.1 Breaking through the dilemma of teachers' cognitive inertia

The mathematics flipped classroom experiment conducted in Guangzhou's Tianhe District serves as a mirror reflecting the deep-seated cognitive inertia among teachers that hinders implementation. While educators meticulously crafted dynamic geometry demonstration videos with high hopes of revitalizing classrooms, actual lessons remain trapped in the traditional three-stage cycle: "video viewing → practice exercises → teacher summary." A revealing observation during classroom observations revealed that 62% of students habitually waited for teachers to provide standard answers during group discussions. This starkly demonstrates that although classrooms have superficially adopted flipped pedagogy, fundamental transformation remains absent, exposing the persistent inertia of "cognitive comfort zones."

A data-driven analysis of a survey conducted among 367 elementary school teachers reveals thought-provoking insights. 81.4% of educators report that "flipped classrooms increase lesson preparation burdens," while 67.2% express concerns about "difficulty maintaining classroom discipline." Teachers have long been accustomed to traditional lecture-based teaching methods, operating with ease in familiar domains and developing fixed pedagogical mindsets. The flipped classroom model demands educators to transition from knowledge transmitters to learning facilitators and organizers—a significant role shift that leaves many feeling unprepared. Teachers worry about adapting to new teaching approaches and fear making mistakes in novel educational environments, leading to resistance toward flipped classrooms. This psychological resistance severely hinders effective implementation, impeding the deepening of educational reforms. To overcome teachers' cognitive inertia, systematic training and guidance are essential to help educators transform their perspectives, enhance capabilities, and gradually step out of their "cognitive comfort zones."

3.2 The adaptation of technical tools to cognitive laws

Hangzhou Xuejun Primary School's innovative use of AR technology to demonstrate planetary orbits in their "Solar System" science class was initially expected to deliver an impactful learning experience. However, post-class assessments revealed disappointing results: students only memorized 38% of planetary characteristics – a mere 5% improvement over traditional teaching methods. Analysis identified the root cause: the technology's application remained at the "presentation level" without achieving deeper "cognitive engagement," violating the "channel effect" and "redundancy effect" principles of Meyer's Multimedia Learning Theory.

To further explore the compatibility between technological tools and cognitive principles, researchers conducted comparative experiments. The same course content was divided into three groups: Group A received pure text explanations, Group B used static images as aids, and Group C employed interactive AR simulations. Results showed that Group C students scored 22.3% higher than Group A in "knowledge transfer" dimension, indicating that interactive AR simulations can enhance students' ability to apply knowledge to new contexts. However, in the "conceptual understanding" dimension, Group C only scored 9.7% higher than Group A, showing no significant difference. This suggests that while advanced technological tools provide innovative teaching methods, their full potential cannot be realized unless they precisely align with educational objectives and adequately consider students' cognitive patterns and learning needs. Therefore, when applying technological tools in education, we should not blindly pursue technical

advancement but instead conduct in-depth research on students' cognitive characteristics, organically integrate technology with teaching, and ensure technology truly serves educational purposes to promote students' learning and development.

3.3 Paradigm reconstruction of evaluation system

Chengdu Caotang Primary School has developed a "Learning Trajectory Tracking System" that monitors 23 metrics including students' pre-class video viewing frequency, classroom participation quality, and post-class assignment revision patterns. This initiative demonstrates the school's proactive exploration of diversified evaluation methods. However, after a year of implementation, it was discovered that teachers still habitually use "accuracy rate" as the sole criterion for assessing learning outcomes. As a result, 65% of students resort to repetitive mechanical drills to chase high scores, completely deviating from the original purpose of flipped classrooms to cultivate critical thinking skills.

In the field of international education, Finland's basic education evaluation reform provides us with valuable experience. Finland has established a three-dimensional evaluation system encompassing "cognitive engagement", "collaborative efficacy", and "innovative expression", adopting a "descriptive feedback + growth portfolio" model to comprehensively and objectively assess students' learning processes and achievements. This evaluation system not only focuses on students' learning outcomes but also emphasizes their performance and progress during the learning process, thereby stimulating students' motivation and creativity. China's primary schools can draw lessons from Finland's successful experience by increasing the weight of formative assessment from the current 15% to 40%. By enhancing the proportion of formative assessment, students are guided to focus on the learning process and develop their comprehensive literacy and innovative capabilities. Meanwhile, teachers should transform their evaluation perspectives, learn to employ diversified assessment methods, and provide timely and accurate feedback to ensure the evaluation system truly serves the teaching objectives of flipped classrooms, promoting students' all-round development.

4 Localization exploration of breakthrough path

4.1 Dual-track teacher training system

The "Flipped Classroom Mentorship Program" implemented in Beijing's Haidian District serves as a beacon, illuminating a systematic and effective training pathway for teachers to adapt to the flipped classroom model. This innovative initiative first carefully selects 30% of core faculty members, providing them with customized six-month specialized training. The program features diverse and highly targeted content, including in-depth analysis of Vygotsky's Zone of Proximal Development in cognitive psychology, enabling teachers to thoroughly understand students' current knowledge levels and potential development capabilities. This allows them to design precise teaching activities that serve as solid stepping stones leading students to knowledge peaks. The technical application section provides detailed instruction on Camtasia video editing techniques, empowering teachers to create visually appealing and content-rich instructional videos that captivate students. In classroom management strategies, the program teaches scaffolding-style problem-guiding methods, where teachers act like skilled architects who progressively guide student thinking, fostering students' autonomous learning abilities.

After completing the training, mentors took on the crucial task of guiding two partner schools in implementing practical initiatives, forming a perfect "theory-practice-reflection" cycle. They skillfully applied theoretical knowledge to actual teaching practices, continuously refining their methods through reflection—much like sharpening a sword on a whetstone to enhance its edge. Data shows that participating teachers achieved a 37% improvement in classroom questioning quality, with their questions becoming more thought-provoking and challenging, akin to stones dropped into still waters that effectively spark students' intellectual curiosity. Meanwhile, students demonstrated a 29% increase in higher-order thinking skills, showing marked progress in analytical, synthetic, and evaluative abilities. This fully validates the effectiveness of the dual-track teacher training system, injecting strong momentum into the advancement of educational reform.

4.2 Hierarchical task design model

The "Three-Stage Task Package" stratified learning model developed by Shanghai's Pudong New Area serves as a precision-engineered educational tool that addresses individual differences, enabling students at all levels to access tailored learning resources. The foundational layer—featuring micro-lecture videos and supplementary exercises—serves as a solid bedrock, ensuring 80% of students master core concepts while building essential foundations for advanced studies. These vivid instructional videos transform abstract knowledge into visual demonstrations, making complex ideas accessible to learners. Complementing these materials are practice exercises designed to reinforce understanding and consolidate key concepts.

The expansion layer tasks adopt interdisciplinary project formats, such as creating "ancient poetry-inspired paintings" through art classes, which organically integrates Chinese language and art disciplines. This approach broadens students' knowledge base and thinking patterns while cultivating comprehensive literacy. During the creative process, students not only gain deep understanding of classical poetry's essence but also unleash their artistic creativity, achieving

knowledge transfer and application. The challenge layer tasks involve open-ended research projects like "What if Li Bai had a smartphone?" creative writing assignments, stimulating innovative thinking and imagination while encouraging students to break free from conventional constraints and courageously explore uncharted territories.

The model has demonstrated remarkable effectiveness, with participation rates among students at different academic levels increasing by 41%, 28%, and 19% respectively. For students with weaker foundations, foundational tasks help them keep pace with the curriculum and build confidence. Average students gain further improvement through extended tasks that cultivate interdisciplinary thinking, while top performers unlock their full potential in challenging tasks, achieving personalized development. This model effectively resolves the dilemma of "overly advanced students feeling under-challenged and struggling learners falling behind," fostering collective growth for all students.

4.3 Home-school-community collaborative support network

Guangzhou's Yuexiu District has established a "Flipped Classroom Community" that creates a comprehensive, multi-level collaborative support network among families, schools, and communities, fostering a nurturing ecosystem for students' academic growth. To help parents better engage in their children's learning journey, the district has developed an expertly crafted Parent Guidance Manual featuring practical tools like video monitoring checklists and classroom performance feedback cards. The video tracking system allows parents to clearly monitor their children's completion of learning tasks through instructional video viewing records, while the performance evaluation cards enable timely tracking of classroom participation and facilitate effective communication with teachers.

The establishment of community learning centers provides students with abundant educational resources, equipped with advanced facilities such as tablets and 3D printers. These resources cater to diverse learning needs while sparking students' interest in education. Students can freely explore and innovate here, applying their knowledge to practical operations. University volunteers offer after-class tutoring, providing professional academic support and personalized learning guidance. With extensive knowledge and patient enthusiasm, these volunteers create customized study plans based on individual needs, effectively helping students overcome academic challenges.

The implementation of this collaborative support network has significantly boosted parental acceptance of flipped classrooms, with approval rates rising from 52% to 89%. Parents now demonstrate greater understanding and support for this innovative teaching model. Students' self-directed learning time increased by 1.2 hours per week, showing marked improvement in initiative and enthusiasm. The close collaboration among families, schools, and communities has woven a robust support network, ensuring the successful implementation of flipped classrooms. This comprehensive approach allows students to thrive under the nurturing light of love.

5 Conclusions

The flipped classroom reform in China's primary schools is at a critical juncture transitioning from "technological adoption" to "paradigm transformation". To address implementation challenges, it is essential to adhere to three core principles: gradualism, contextualization, and systematization. Gradualism requires avoiding "campaign-style" promotion, allowing schools to advance step-by-step based on faculty capabilities; contextualization emphasizes developing localized teaching resources that align with Chinese children's cognitive characteristics; systematization entails building an ecosystem encompassing policy, technology, evaluation, and social dimensions. Looking ahead, artificial intelligence holds potential for in-depth exploration in areas such as personalized learning path planning, balanced resource allocation of flipped classrooms between urban and rural schools, and the integration of traditional culture with modern teaching technologies. As highlighted in the OECD's "Education 2030" report, the essence of educational innovation lies in returning to the fundamental nature of learning. Rooted in local contexts, China's primary school flipped classroom practices are contributing unique solutions infused with Eastern wisdom to global educational digital transformation, with the potential to shine on the international education stage.

About the Author

Xuewei Lu, female, Han Nationality, born in June 1993, hanzhong, Shaanxi Province, working at Rundong Nine-year School, Chenggu County, Shaanxi Province, master degree, second-level teacher, research direction: educational management.

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