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Educational Sensitivity of Senior High School Teachers' Thinking Teaching: Present Situation and Promotion Path —— Qualitative Research Based on Classroom Interaction

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Abstract: *This qualitative study explores the current status of senior high school teachers' pedagogical sensitivity to thinking instruction (PSTI) and identifies pathways for enhancement, with a focus on classroom interaction dynamics; through in-depth classroom observations, semi-structured interviews, and document analysis involving 12 teachers from three senior high schools in Chengdu, the study reveals three key findings: firstly, PSTI manifests in varying degrees, with most teachers demonstrating basic awareness but limited ability to scaffold higher-order thinking; secondly, key challenges include insufficient recognition of students' thinking traces, over-reliance on preset lesson plans, and inadequate feedback strategies for divergent thinking; and thirdly, effective enhancement paths involve context-specific professional development, collaborative lesson study centered on thinking-oriented interaction, and reflective practice anchored in classroom discourse analysis, while the study also contributes to understanding how teachers can foster students' critical and creative thinking through sensitive instructional responses.*

Keywords: *Pedagogical Sensitivity to Thinking Instruction; Senior High School Teachers; Classroom Interaction; Qualitative Research; Professional Development*

1. Introduction

1.1 Background

In the context of educational reforms emphasizing "core competencies," developing students' higher-order thinking (e.g., critical analysis, logical reasoning, and creative problem-solving) has become a central goal of senior high school education (Ministry of Education of China, 2017). [2]However, translating this goal into practice hinges on teachers' ability to perceive, interpret, and respond to students' thinking processes during classroom interactions—a capacity defined here as "pedagogical sensitivity to thinking instruction (PSTI)" (van Manen, 2016). PSTI goes beyond general pedagogical skills; it requires teachers to attune to subtle cues in students' questions, errors, and reasoning, and to adapt instruction to deepen thinking rather than merely transmit knowledge.[3]

Despite growing recognition of PSTI's importance, empirical research on its manifestation in Chinese senior high school classrooms remains limited. Existing studies (e.g., Li & Zhang, 2021) highlight gaps between teachers' stated commitments to thinking instruction and their actual classroom practices, particularly in rigidly structured subjects like mathematics and science. This disconnect suggests a need to investigate PSTI's current status, bottlenecks, and actionable enhancement strategies.[4]

1.2 Research Questions

This study addresses three core questions:

How does senior high school teachers' PSTI manifest in classroom interaction?

What challenges hinder the development of PSTI among these teachers?

What pathways can effectively enhance teachers' PSTI?

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1.3 Significance

The study contributes to theoretical and practical discourses on thinking instruction. Theoretically, it operationalizes PSTI within a Chinese educational context, enriching understanding of teacher sensitivity in dynamic classroom settings. Practically, it offers evidence-based strategies for teacher training programs and school-based professional development, aiming to bridge the gap between policy mandates and classroom practice.

2. Literature Review

2.1 Conceptualizing Pedagogical Sensitivity to Thinking Instruction (PSTI)

Pedagogical sensitivity, as defined by van Manen (1991), refers to teachers' ability to "perceive the subtle meanings in students' behaviors and respond with pedagogically appropriate actions."[1] Extending this, PSTI specifically focuses on sensitivity to thinking processes—i.e., teachers' capacity to: (1) recognize students' thinking traces (e.g., partial reasoning, misconceptions, or creative insights) in verbal and nonverbal cues; (2) interpret the underlying cognitive mechanisms (e.g., deductive reasoning vs. intuitive guesses); (3) respond with strategies that scaffold rather than suppress thinking (e.g., probing questions, prompting reflection, or inviting peer critique) (Mason, 2002).[5]

2.2 Manifestations of PSTI in Classroom Interaction

Research on teacher-student interaction identifies three key dimensions of PSTI:

Attunement: Teachers' awareness of students' thinking beyond correct/incorrect answers. For example, noticing a student's "wrong" solution reveals a unique reasoning path (Sherin, 2007).[6]

Responsiveness: Adapting instruction to nurture thinking, such as rephrasing questions to clarify confusion or extending tasks to challenge advanced thinkers (Franke et al., 2007).[7]

Intentionality: Designing interaction patterns (e.g., small-group discussions, Socratic dialogue) that systematically elicit and refine thinking (Resnick, 2018).[8]

2.3 Challenges in Developing PSTI

Studies indicate multiple barriers:

Epistemological beliefs: Teachers who view knowledge as fixed tend to prioritize correctness over thinking processes (Liu & Wang, 2020).[9]

Classroom constraints: Time pressure and curriculum demands often lead to rushed interactions, limiting deep engagement with students' reasoning (Ball & Forzani, 2011).[10]

Limited training: Pre-service and in-service programs rarely focus on analyzing thinking cues or designing responsive feedback (Lin et al., 2019).[11]

2.4 Enhancement Strategies

Effective approaches include:

Video-based reflection: Analyzing classroom recordings to identify missed opportunities for thinking instruction (Sherin & van Es, 2009).[12]

Collaborative lesson study: Co-designing lessons with a focus on thinking-oriented interaction and debriefing outcomes (Lewis & Hurd, 2011).[13]

Cognitive coaching: Guiding teachers to articulate their interpretive processes when responding to students' thinking (Costa & Garmston, 2002).[14]

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3. Methodology

3.1 Research Design

This study adopts a qualitative approach, using case study methodology to explore PSTI in natural classroom settings. Qualitative methods are chosen for their suitability in capturing the complexity of classroom interaction and teachers' subjective experiences (Merriam, 2009).[15]

3.2 Participants

Participants were 12 senior high school teachers from three public schools in Chengdu, representing core subjects (mathematics, physics, Chinese, and English). Purposive sampling ensured diversity in teaching experience (3–20 years) and subject areas (Table 1).

Table 1 Participant Demographics

Teacher ID	Subject	Teaching Experience (Years)	Gender
T1	Mathematics	8	Male
T2	Physics	15	Female
T3	Chinese	5	Female
...	...	...	...
T12	English	12	Male

3.3 Data Collection

Data were collected over six months (September 2023–February 2024) through three methods:

Classroom observations: 6–8 lessons per teacher (total 92 lessons), recorded via video and field notes focusing on interaction episodes (e.g., student questions, teacher feedback, group discussions).

Semi-structured interviews: Two interviews per teacher (pre- and post-observation), exploring their beliefs about thinking instruction, perceived challenges, and reflections on observed lessons. Interviews lasted 45–60 minutes and were transcribed verbatim.

Document analysis: Teachers' lesson plans, student work samples, and reflective journals to triangulate observational and interview data.

3.4 Data Analysis

Data were analyzed using thematic analysis (Braun & Clarke, 2006) in three phases:

Open coding: Labeling PSTI-related behaviors (e.g., "ignoring student reasoning," "probing for deeper explanation").

Axial coding: Identifying relationships between codes to form sub-themes (e.g., "responsiveness to misconceptions").

Selective coding: Synthesizing sub-themes into overarching themes (e.g., "PSTI levels," "enhancement strategies").[16]

Trustworthiness was ensured through member checking (teachers reviewed findings), peer debriefing, and triangulation across data sources (Lincoln & Guba, 1985).[17]

4. Results

4.1 Current Status of PSTI: Three Levels of Manifestation

Analysis revealed three distinct levels of PSTI among participants, based on attunement, responsiveness, and intentionality:

4.1.1 Basic Awareness Level (5 teachers)

Teachers at this level recognized the importance of thinking instruction but demonstrated limited sensitivity in practice. They often focused on correctness rather than reasoning, as illustrated in this

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mathematics lesson excerpt:

T5 (Mathematics, 6 years of experience): "Your answer is wrong. The formula for quadratic functions is ax^2+bx+c, not ax^2+b. Let's move on."

When a student attempted to explain, "I thought b was zero here," T5 dismissed it: "We don't have time for that now." Field notes indicated that such interactions prioritized curriculum coverage over exploring students' thinking.

4.1.2 Developing Level (5 teachers)

These teachers showed intermittent sensitivity, occasionally probing thinking but struggling to sustain it. For example, T2 (Physics, 15 years) noticed a student's unusual approach to a mechanics problem:

T2: "Interesting. Why did you use energy conservation here instead of force analysis?"

Student: "Because the object is moving in a curve, and forces are complicated."

T2: "Good observation. Let's see if that works."

However, T2 did not extend the interaction to connect the two methods, missing an opportunity to deepen conceptual understanding.

4.1.3 Proficient Level (2 teachers)

Teachers at this level consistently attuned to thinking cues and responded strategically. T7 (Chinese, 12 years) demonstrated this during a literature discussion:

Student: "I think the protagonist's choice is selfish, not heroic."

T7: "That's a provocative view. Can you point to specific passages that support this? Let's hear others' reactions—does anyone see it differently?"

T7's response validated the student's perspective, elicited evidence, and fostered peer dialogue, creating a thinking-rich interaction.

4.2 Key Challenges to PSTI Development

Four primary challenges emerged:

Limited recognition of thinking cues: 8 teachers failed to identify subtle indicators of students' reasoning, such as hesitations or partial answers, dismissing them as "confusion."

Curriculum-driven rigidity: All participants cited pressure to complete syllabi, leading to rushed interactions. As T3 noted: "I know I should explore their ideas, but if I do, we'll fall behind."

Inadequate feedback strategies: Teachers often used evaluative feedback ("Good job") instead of formative feedback ("What evidence supports that?"), limiting thinking stimulation.

Weak metacognitive awareness: Most teachers could not articulate how they interpreted students' thinking, relying on intuition rather than intentional strategies.

4.3 Perceived Enhancement Needs

Teachers identified three priorities for development:

Training in analyzing classroom discourse for thinking traces.

Collaborative planning of thinking-oriented lessons.

Structured reflection tools to evaluate their responsiveness.

5. Discussion

5.1 Interpreting the Current Status of PSTI

The three-level distribution of PSTI aligns with Mason's (2002) observation that teachers' sensitivity develops from "unaware" to "strategic." The dominance of basic and developing levels

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(10/12 teachers) reflects systemic challenges in Chinese senior high schools, where exam-oriented pressures often prioritize content coverage over thinking development (Li, 2022).[18]

The proficient teachers' practices highlight two critical features: (1) valuing student voice as a window into thinking, and (2) using open-ended questions to sustain cognitive engagement. This supports Franke et al.'s (2007) finding that effective thinking instruction requires both attunement and strategic responsiveness.

5.2 Challenges in Context

The identified challenges resonate with international research. The tension between curriculum demands and thinking instruction mirrors Ball & Forzani's (2011) observation that "coverage anxiety" undermines responsive teaching. Additionally, the limited use of formative feedback aligns with Liu & Wang's (2020) study, which found that Chinese teachers often view feedback as evaluative rather than developmental.

A notable context-specific challenge is the influence of hierarchical teacher-student norms, where 6 teachers admitted hesitating to "waste time" on students' "incorrect" ideas due to perceived loss of authority—a dynamic less prominent in Western contexts (Zhang & Qi, 2023).[[19]

5.3 Implications for Enhancement Paths

Based on the findings, three pathways are proposed:

Contextualized professional development: Workshops focusing on local curriculum constraints, teaching participants to identify thinking cues within exam-related content. Video analysis of local teachers' lessons (rather than imported examples) could enhance relevance.

Collaborative lesson study with a thinking focus: Structured lesson co-design, implementation, and debriefing, centered on questions like: "What thinking cues did we miss?" and "How could feedback be adjusted?" This builds on Lewis & Hurd's (2011) model but emphasizes thinking-specific interactions.[2]

Reflective practice tools: Development of a "PSTI checklist" for teachers to self-assess their responsiveness, including items like: "Did I probe beyond correct answers?" and "Did I connect student ideas to broader concepts?"

These pathways address both individual skills and systemic constraints, recognizing that PSTI development requires more than individual effort—it demands school-level shifts in priorities and support structures.

6. Conclusion

This study provides a nuanced portrait of senior high school teachers' PSTI, revealing a spectrum of practice from basic awareness to proficiency. Key challenges include limited cue recognition, curriculum rigidity, and inadequate feedback strategies, while enhancement requires context-specific training, collaborative planning, and structured reflection.

6.1 Limitations

The small sample size (12 teachers) limits generalizability, and the focus on Chengdu schools may not capture regional variations. Future research could expand to larger, more diverse samples and incorporate quantitative measures of PSTI.

6.2 Future Directions

Longitudinal studies tracking PSTI development over time, and experimental research testing the efficacy of proposed enhancement strategies, would provide valuable insights. Additionally, exploring how school leaders can foster a culture supportive of thinking instruction merits attention.

Ultimately, enhancing PSTI is critical for transforming senior high school classrooms into spaces where students' thinking is not just assessed but actively nurtured—a cornerstone of 21st-century education.

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