

Exploring Teachers' Pedagogical Beliefs and Classroom Practices for Fostering Critical and Creative Thinking: A Phenomenographic Perspective

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Abstract:

In the rapidly evolving landscape of global education, the role of teachers has become complex and dynamic. These transformations demand not only a rethinking of curriculum and assessment practices but also a profound shift in teachers' pedagogical beliefs and instructional strategies. Among the most emphasized goals in contemporary education is the development of "21st-century skills." In this context, fostering such higher-order thinking skills in classrooms has become a central objective of educational policies and pedagogical frameworks worldwide. However, the actualization of these objectives largely depends on teachers' beliefs about teaching-learning, understanding of critical and creative thinking, and the strategies they use to integrate these skills into classroom practices. This study adopts a phenomenographic approach to explore how teachers conceptualize and implement pedagogical practices aimed at nurturing critical and creative thinking among students. By examining variations in teachers' conceptions and practices, this study aims to offer deeper insight into the challenges and opportunities they face in translating educational goals into meaningful classroom realities. In conclusion, the study emphasizes that while teachers recognize the importance of critical and creative thinking and employ a variety of strategies to foster them, systematic reforms are essential to overcome persistent barriers.

Keywords: Critical thinking, Creative thinking, Pedagogy, 21st century skills.

1. Introduction:

A key aim of modern education is to develop students' critical and creative thinking skills. Critical thinking enables them to reason within subject areas, assess information independently, and solve real-life problems effectively. On the other hand, creative thinking encourages originality, generates new ideas, adapts a new situation, and creates innovative solutions (Bailin, 1987). In earlier times, teachers were regarded as the primary source of knowledge, with their main responsibility being to transmit information to students through lectures and direct instruction. However, in the 21st century, the role of teachers has shifted significantly. Instead of acting solely as lecturers, teachers are now seen as facilitators of learning who guide, support, and create opportunities for students to construct knowledge actively (Ujlakyne, 2009). This paradigm shift requires teachers to constantly update their skills, knowledge, and practices in order to respond effectively to the diverse and changing needs of learners. Today education is evolving with various factors such as rapid scientific and technological advancements, demographic changes, globalization, and environmental challenges (Maba et al., 2023). These transformations have redefined the expectations placed on schools and teachers. Schools now function within a highly competitive educational environment where they are not only responsible for delivering high-quality instruction but also for serving as active partners in community development. Consequently, there is a growing emphasis on teacher professionalism and accountability to ensure that learners are adequately prepared for the demands of the modern world.

A 21st-century professional teacher is therefore envisioned as a lifelong learner who embraces continuous professional development and demonstrates flexibility in adapting to new teaching contexts. Such teachers are expected to collaborate meaningfully with colleagues, adhere to ethical and professional standards, and engage effectively with parents and communities. Furthermore, the ability to communicate and interact in both face-to-face and digital environments has become essential for building strong partnerships that support student learning and holistic school development (Maba et al., 2023; Ward et al., 2021). 21st-century skills, including critical thinking, problem solving, creativity, communication, digital and technological literacy, civic responsibility, and global awareness, which are now considered essential competencies for learners (Dede, 2010).

However, fostering such skills in students requires more than simply integrating them into curricula; it begins with teachers themselves. The teacher must first value these skills, develop a belief in their relevance, and then intentionally design and implement pedagogical practices that nurture them in the classroom. This means adopting innovative teaching and learning methods that go beyond traditional rote-based approaches. Strategies such as collaborative learning, inquiry-based learning, project-based assignments, problem-solving activities, and integration of technology in teaching are crucial in cultivating these competencies.

Thus, the professional identity of teachers today is not confined to subject knowledge alone; it extends to their role as change agents, facilitators of lifelong learning, and promoters of global citizenship. Their commitment to continuous growth, adaptability, and student-centred practices ensures that education remains relevant, empowering, and future-oriented in a rapidly transforming world.

2. Overview of Critical Thinking and Creative Thinking:

Critical thinking has many definitions, but most agree it is careful, goal-directed thinking aimed at deciding what to believe or do, while meeting standards of adequacy and accuracy. In education, critical thinking is best seen as a process involving knowledge, skills, and dispositions that students must adopt and apply (Hitchcock, 2018). Critical thinking is essentially normative, meaning it is judged as “good thinking” because it meets standards of reasonableness, accuracy, and justification. It is a reflective, reason-based, self-correcting, and context-sensitive thinking that guides beliefs and actions (Bailin & Siegel, 2003). Critical thinking emphasizes judgment, assessment, and rational analysis, whereas creative thinking involves originality, intuition, and combining ideas in new ways. Huitt (1998) proposes a model inspired by Bloom's Taxonomy and highlights that critical thinking is not only a cognitive process but also involves affective, conative, and behavioral dimensions. The process begins with an external stimulus that needs evaluation. Affective disposition means the willingness to think critically to trigger the process. Through critical thinking, a person either

confirms an existing belief or forms a new one, which is stored as declarative knowledge or may include images or visualizations.

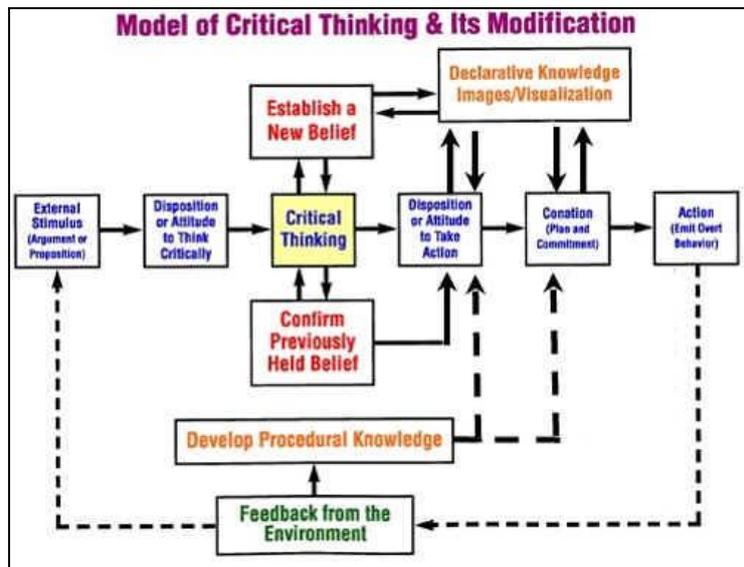


Figure 1: Modified model of critical thinking proposed by Huitt (1998)

The model depicted in Figure 1 illustrates that critical thinking encompasses not only cognitive aspects but also affective, conative, and behavioral components. A stimulus triggers an evaluation, leading to either the formation of new beliefs or the confirmation of existing ones stored in memory. Action follows, guided by motivation and corrected through feedback, which builds procedural knowledge.

Creativity is not limited to the arts; it can be encouraged and expressed across all school subjects and curriculum areas. Even simple or routine content can foster students' creativity, as long as teaching methods promote imagination and creative thinking (Kampylis & Berki, 2014). Creative thinking is the ability to view problems from new perspectives and generate original solutions- "thinking outside the box." It involves the perception, imagination, and techniques like brainstorming, heuristics, or provocations to explore alternatives. Creativity enhances problem-solving by fostering multiple ideas, encouraging diverse viewpoints, and making it a skill that can be learned and applied across contexts (Gafour & Gafour, 2020). Table 1 shows a clear and concise comparison of critical thinking and creative thinking adopted from various reviews of related literature.

Table 1: Comparison between critical thinking & creative thinking

Aspects	Critical thinking	Creative thinking
Definition	Careful and logical thinking aimed at evaluating information, arguments, and decisions (Facione, 2011).	Thinking that generates new ideas, perspectives, or solutions by “thinking outside the box” (Gafour & Gafour, 2020).
Main focus	Analysis, evaluation, judgment, and problem solving (Ennis, 2011).	Innovation, originality, imagination, and idea generation (Runco & Jaeger, 2012).
Approach	Structured, logical, rational, evidence-based (Paul & Elder, 2019).	Flexible, exploratory, intuitive, often unstructured (Sternberg, 2009).
Process	Involves questioning, reasoning, comparing, analyzing, and making judgments (Ennis, 2011).	Involves brainstorming, visualizing, experimenting, and connecting unrelated ideas (Sawyer, 2024).
Outcome	Reliable conclusions, better decision-making, and effective problem-solving (Paul & Elder, 2019).	Original ideas, innovative solutions, and novel approaches (Runco & Jaeger, 2012).
Related Bloom’s	Higher order thinking: evaluation and analysis (Anderson &	Higher order thinking: synthesis or creation (Anderson & Krathwohl,

level	Krathwohl, 2001).	2001).
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3. Objectives of the Study:

The main objectives of the study are as below:

- To examine teachers' conceptions of critical and creative thinking in the classroom.
- To explore how pedagogical beliefs influence instructional strategies.
- To identify challenges and opportunities in implementing teaching practices that foster critical and creative thinking.

4. Methodology of the Study:

This study adopts a qualitative phenomenographic design to capture variations in teachers' beliefs and practices. Phenomenography is a qualitative research approach within the constructivist paradigm, focused on describing the different ways people experience and understand a single phenomenon (Bowden, 2000). These varied understandings are called "design of thought" based on lived experience (Sims, 2024). According to Bowden (2000), phenomenographic research follows a structured process beginning with planning, where the purpose of the study and suitable strategies are defined. In data collection, researchers decide who to involve, why they are chosen, and how data will be gathered, then analyze the data qualitatively. Interpretation situates findings within the study's context.

In this study, 10 teachers participated from secondary and higher secondary schools of West Bengal. The participants represented diverse subject areas, teaching experiences, and institutional settings. Semi-structured interviews were conducted, focusing on teachers' understanding of critical and creative thinking, instructional strategies, and perceived challenges. The data were transcribed and coded to identify categories of description representing qualitatively different ways of teachers' beliefs and practices about critical and creative thinking.

5. Findings and Discussion:

The analysis of the qualitative perspective is categorized into five broader themes, each with its own codes.

Theme 1: Conceptions of critical and creative thinking

Teachers' beliefs about what critical and creative thinking means shape how they attempt to foster them in classrooms. The responses reveal three main conceptions:

- **Analytical orientation (critical thinking):**

Teachers conceptualized critical thinking as a process of rational inquiry where learners go beyond surface-level understanding to analyze, evaluate, and synthesize information. According to their perspectives, critical thinking is not merely about recalling facts but about questioning, examining relationships, and drawing conclusions. As one teacher explained, *“Critical thinking helps the learners to analyze the causative factors of a geographical phenomenon or pattern.”* This highlights the analytical nature of critical thinking, where students are encouraged to probe into the ‘why’ & ‘how’ rather than simply describing ‘what’ happened. In this way, learners develop the habit of connecting causes with consequences, identifying patterns, and interpreting evidence.

Another teacher emphasized that *“Critical thinking involves analyzing information, evaluating evidence, and making reasoned judgments.”* This perspective underscores the evaluation dimension of critical thinking, where students and teachers are trained to search for different forms of evidence, assess their reliability, and construct a logical judgment.

Researchers have similarly described critical thinking as the ability to think in a reflective and disciplined manner, focusing on analyzing arguments, evaluating evidence, and solving problems effectively (Ennis, 2011; Paul & Elder, 2019). Brookfield (2013) further highlights that critical thinking entails questioning and exploring multiple perspectives.

These insights show that teachers view critical thinking as a rational, evidence-based process that strengthens students' ability to question ideas. In classroom practice, this orientation fosters independent thinking, problem-solving, and decision-making skills.

- **Imaginative orientation (creative thinking):**

Teachers described creative thinking as the ability to move beyond routine responses and generate new, original, and useful ideas. Creativity, in their understanding, was not limited to artistic expression but was seen as a broader intellectual capacity that involves imagination, exploration, and innovation in solving real-world problems.

As one teacher noted, "*Creative thinking helps the learners to innovate of design a solution to a geographical problem.*" This highlights the applied nature of creativity, where learners are encouraged to imagine alternative possibilities. For instance, when analyzing geographical issues such as urban pollution or waste management, students may be guided to design eco-friendly models.

Another teacher remarked, "*To generate or innovate new ideas, imagine possibilities, and produce new or original concepts.*" This perspective underscores the generative nature of creativity, where students learn to think divergently and develop fresh perspectives.

Scholarly literature supports this interpretation of creativity as a process of involving fluency, flexibility, and originality (Guilford, 1967). It also emphasizes everyday problem-solving and innovation in classrooms (Craft, 2005). Overall, teachers' recognition of imaginative orientation indicates an educational focus on nurturing students' capacity to innovate, adapt, and create knowledge rather than merely consume it.

- **Integrated understanding:**

Some teachers emphasized that critical thinking and creative thinking should not be treated as separate or competing abilities. From this perspective, critical thinking ensures depth, accuracy, and logical evaluation while creative thinking contributes novelty, imagination, and

innovation. Together, they form a balanced intellectual process that prepares learners to engage effectively with complex problems.

Teachers expressed, *“Critical and creative thinking means enabling students to analyze information deeply, question assumptions, and approach problems with innovative ideas.”*

This perspective highlights that the synergy between the two orientations is that critical thinking provides an evaluative lens that allows learners to examine evidence and avoid errors, while creative thinking opens pathways to alternative possibilities. Sternberg (2009) emphasized that problem solving in the real world demands both convergent and divergent thinking. By adopting this holistic view, teachers demonstrate a pedagogical belief that education should nurture students who are both evaluative and imaginative.

Theme 2: Beliefs about subject relevance

In this theme, teachers were asked if all subjects can foster these skills. The answers show both Universalist and subject-specific views.

- **Universal potential across subjects:**

Teachers widely expressed the belief that both critical and creative thinking are not confined to a single domain but can be cultivated across all disciplines. As one teacher affirmed, *“Yes, all subjects can promote both skills,”* while another added, *“All subjects have the scope to provoke the students to think critically.”* Similarly, a third teacher noted, *“All subjects can generate new concepts and abilities.”* This perspective reflects a democratic view of curriculum design, where every subject, like mathematics, science, literature, or social studies, is seen as an avenue for developing higher-order thinking skills. Rather than privileging certain disciplines as inherently analytical or imaginative, teachers emphasize their own agency in designing learning experiences that integrate both critical and creative elements. This aligns with global educational frameworks (Partnership for 21st century skills, 2009).

- **Subject-specific strength:**

While affirming the universal potential of all subjects, teachers also recognized that different disciplines lend themselves more naturally to particular modes of thinking. For example, one teacher explained, *“In science, evaluating the reliability and experimental data.”* While another highlighted *“In mathematics, applying problem-solving strategies.”* In contrast, a teacher emphasized that *“In arts and literature, encouraging imagination and expression.”* These reflections suggest that mathematics enhances analytical reasoning, evaluation, and logical consistency, while arts and humanities tend to prioritize divergent thinking, imagination, and expressive exploration. Alsaleh (2020) pointed out these arguments that critical thinking is integrated into all subjects, where students practice skills through discipline-specific tasks, discussions, and problem-solving

- **Pedagogical dependence:**

Teachers further stressed that the successful cultivation of critical and creative thinking depends less on subject matter itself and more on how the subject is taught. As one teacher explained, *“Yes, it depends on how teachers are taught and how students engage with them.”* This view reinforces the idea that pedagogy is the primary driver of 21st-century skill development. In this sense, the most analytical subject can encourage imagination if taught through inquiry-based projects. Pedagogical dependence on critical thinking and creative thinking is supported by Song (2016); Tsui (2002); Celume et al., (2029); and Revenko et al., (2024).

Theme 3: Classroom practices to foster critical thinking

Teachers provided examples of deliberate strategies to develop students’ reasoning and evaluation skills. Their practices reflected the belief that critical thinking requires structured opportunities to question, analyze, and assess information from multiple perspectives.

- **Problem/Issue-Based Tasks:**

One teacher shared, *“In the lesson on ‘Environmental Degradation’, the students were assigned to prepare a list of causes explaining why local people promote forest fires...”* Such

a task positions students to interrogate real-world issues, where they must uncover motivations, recognize contradictions, and the implications of social practices. By situating learning in authentic contexts, teachers promote critical inquiry that goes beyond textbook knowledge. Problem-based learning generates innovative solutions through experience, and it integrates critical thinking to foster innovations and support sustainable education (Birgili, 2015).

- **Debates & Discussions:**

Another teacher explained, *“A classroom activity... could be a debate or discussion on a controversial topic where students must research, present arguments, counter opposing views...”* These strategies encourage learners to collect evidence, construct reasoned arguments, and critically evaluate different perspectives. According to Healey (2012), debates can engage students in critical thinking, political analysis, and the development of transferable skills.

- **Analytical Exercises:**

Even in literature, analysis becomes a tool to foster critical interpretation. As one teacher described, *“Analyzing poetry from different perspectives and with different time frames.”* Here, students learn to move beyond surface-level interpretation and instead examine texts through multiple analytical lenses. Scholarly literature supports this idea that exercise of the wordbook can enhance critical thinking (Wallace & Jefferson, 2015). Even online modules help students to develop critical thinking (Brahler et al., 2002).

Theme 4: Classroom Practices to Foster Creativity

Teachers also identified practices that aim to cultivate originality, imagination, and innovation. Creative thinking in the classroom was linked to open exploration, problem solving, and expressive tasks.

- **Project-Based Learning:**

A teacher described, *“In the lesson of ‘Waste Management’, the students were assigned to design a model on how they can take initiatives to promote the 4R collaboratively...”* Here, creativity emerges through applied problem-solving, teamwork, and practical design. Such activities encourage learners to move beyond theoretical understanding and generate innovative, real-world solutions. Cahyani (2021) pointed out that project-based learning actively engages students, motivates them, and fosters creativity, making it an effective approach for enhancing students' creative skills.

- **Open-Ended Exploration:**

Another teacher noted, *“Creativity can be encouraged through project-based learning where students design experiments, create stories, or develop solutions to real-world problems.”*

Open-ended tasks push learners beyond memorization, offering space to explore multiple possibilities. Open-ended exploration can enhance creativity in various fields of study, like science and the arts (Kemppainen, 2017; Alhusaini, 2012; Alhusaini & Maker, 2025).

- **Artistic/Imaginative Activities:**

Another teacher pointed to more explicitly imaginative practices, such as *“Writing and analyzing any text,”* or *“Imagining future landscapes.”* These tasks prioritize imagination, originality, and personal expression, linking creativity with identity-building and divergent thinking. Vygotsky’s ideas on imagination help us understand young children’s creative experiences in both formal and informal settings, guiding classroom practices and curricular choices that support creativity in the early years (Echoff & Urbach, 2008).

Theme 5: Challenges in Fostering Critical and Creative Thinking

Despite their aspirations, teachers reported facing significant barriers to effectively implementing critical and creative thinking in classrooms. These challenges exist at systematic, institutional, and classroom levels.

- **Time & Curriculum Constraints:**

The teacher mentioned the pressure of rigid schedules and syllabus-driven teaching. As one noted, *“Time management & lack of appropriate stimulus to motivate the learners.”* Rigid schedules and syllabus pressures limit opportunities for inquiry-based and creative work.

- **Assessment Difficulties:**

The lack of effective evaluation methods emerged as another challenge. One teacher admitted, *“Lack of clear methods for assessing creative thinking.”* Current assessment frameworks tend to prioritize correct answers and factual recall over originality. This creates a mismatch between pedagogical aspirations and institutional accountability measures.

- **Institutional/Environmental Barriers:**

Teachers also felt limited by systemic issues. As they stated, *“Lack of proper training in these areas,”* *“Lack of creative school culture poses significant challenges.”* Without professional development or institutional support, teachers struggle to adopt innovative approaches consistently.

- **Learner Mindset & Attitudes:**

One of the teachers mentioned that, *“Stereotyping attitudes of a learner who only believes that the meaning that a reference book suggests only to follow.”* Many students are conditioned by rote learning traditions.

- **Structural Barriers:**

Teachers pointed to large class sizes as a major limitation. *“Teacher-Student ratio,”* one noted, makes it difficult to provide individualized attention, facilitate discussions or engage learners in project-based work.

6. Summary and conclusion:

The findings of the study reveal that teachers generally conceptualize critical thinking as a process of analysis, logical reasoning, and evidence-based judgment, whereas creative thinking is understood in terms of imagination, innovation, and the generation of new ideas. This dual orientation reflects an awareness that both skills are necessary for preparing 21st-century learners.

Teachers expressed a broadly democratic view of curriculum design, emphasizing that critical and creative thinking can be nurtured in any subject area. However, they also acknowledged that different disciplines have distinct strengths that lend themselves more naturally to one type of thinking. For instance, science and mathematics were seen as contexts where learners engage in evidence evaluation, logical reasoning, and problem-solving, whereas the arts and literature were highlighted as aspects for fostering imagination, originality, and expressive creativity.

In terms of classroom practices, teachers described a range of strategies that deliberately promote these skills. Critical thinking was often fostered through debates, discussions, and problem-based tasks that required learners to examine real-world problems, analyze multiple perspectives. Creative thinking, on the other hand, was encouraged through project-based learning, open-ended exploration, and imaginative exercises such as designing models, creating stories, or visualizing alternative futures. These practices show that teachers are not only aware of the importance of these skills but also actively experiment with pedagogical approaches to embed them within classroom learning.

Despite these efforts, teachers reported encountering significant challenges in fostering critical and creative thinking. Structural and systematic constraints such as rigid curricula, syllabus pressures, and large class sizes often restrict the scope of inquiry-based and creative tasks. Assessment practices that prioritize factual recall over originality or depth of thinking were also seen as barriers. Furthermore, a lack of institutional support in terms of training and professional development, absence of creative school cultures, made it difficult to sustain innovative pedagogical approaches. At the classroom level, students' stereotype thinking about reference books, traditional methods creates barriers.

The study emphasizes that while teachers recognize the equal importance of critical and creative thinking and employ a variety of strategies to foster them, systematic reforms are essential to overcome persistent barriers. For these skills to be meaningfully integrated into educational practice, reforms in curriculum design, teacher training, assessment frameworks, and classroom structures are needed. Equally important is cultivating learners' mindsets that value inquiry, imagination, and

independent thinking. By addressing these challenges, education can move toward creating holistic learning environments where students are empowered to think critically and creatively.

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Authors Contribution:

- Dr. Upadhyay conceptualized the study, provided supervision for the analysis, ensured the overall methodological and academic rigor, and prepared the initial draft of the manuscript.
- Dr. Pandey contributed to data extraction, participated in quality assessment, and assisted in the interpretation of the findings.
- Ms. Karmakar performed the data analysis, contributed to quality assessment and interpretation of results, and assisted in the preparation of the manuscript.
- All authors critically reviewed, revised, and approved the final version of the manuscript for publication.

Conflict of Interests:

All authors declare that they have no conflicts of interest.

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