

Developing Critical Thinking Skills Among Primary School Pupils In The Learning Process

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Abstract. This theoretical and analytical study examines pedagogical approaches to developing critical thinking among primary school pupils. Drawing on foundational accounts of reflective thinking, sociocultural learning and critical-thinking skills, it identifies age-appropriate components of critical thinking and systematises six instructional approaches: problem-based learning, purposeful questioning, comparison and classification, discussion and collaborative work, graphic organisers, and reflective exercises. The analysis specifies the classroom conditions required for these approaches and proposes a five-stage instructional model encompassing activation of prior knowledge, a problem question, information analysis, justified conclusions and reflection. A classroom illustration concerning responsible water use demonstrates how the model may be implemented. The outcomes are a conceptual synthesis and practical recommendations rather than findings from an intervention study; the effectiveness of the model has not yet been empirically tested.

Keywords: critical thinking; primary education; primary school pupils; cognitive engagement; problem-based learning; instructional methods; learner autonomy; reflection.

1. Introduction

Contemporary education is concerned not only with pupils' acquisition of subject knowledge but also with their capacity to think independently, evaluate information, make reasoned decisions and apply what they have learned in unfamiliar situations. Developing critical thinking in primary education is therefore an important dimension of improving teaching and learning.

Primary school is a formative period for cognitive development. During these years children begin to consolidate logical operations, compare objects and events, identify cause-and-effect relationships, ask questions and support their own judgments. Teaching should consequently extend beyond the reproduction of information to provide opportunities for independent reasoning.

John Dewey described reflective thinking as a sustained process of examining a problem, its grounds and its implications [1]. Lev Vygotsky's sociocultural account likewise emphasises the role of instruction and social interaction in cognitive development [2]. These perspectives help explain why carefully structured dialogue and inquiry may be particularly valuable in early schooling.

Critical thinking involves analysing information, evaluating reasons, relating evidence to claims and reaching justified conclusions. In primary classrooms, these capacities can be observed when pupils explain an answer, compare alternative solutions and check the outcome of their work [3]. The relevance of the present study lies in the need for teachable strategies that strengthen pupils' autonomy and meaningful participation in learning.

The aim is to provide a theoretical justification for the pedagogical conditions that support critical thinking in primary school and to identify methods suitable for classroom use. Specifically, the study reviews leading conceptual approaches,

considers developmental characteristics, categorises instructional techniques and formulates practice-oriented recommendations.

2. Materials and Methods

The study adopts a theoretical and analytical design grounded in educational psychology and pedagogy. Its conceptual foundation includes Dewey's account of reflective inquiry [1], Vygotsky's theory of socially mediated cognitive development [2], Paul and Elder's principles of reasoning [3], Ennis's account of reflective judgment [4] and Facione's classification of core critical-thinking skills [5]. Anderson and Krathwohl's revised taxonomy [6] and Lipman's discussion-based educational approach [7] further inform the pedagogical interpretation.

Five complementary procedures were used: a review of the cited literature to clarify theoretical positions; comparative analysis to identify convergent and contrasting emphases; synthesis to establish principal components of critical thinking; classification of classroom techniques; and pedagogical modelling to construct a sequence of activities designed to foster analytical and reflective skills.

The object of analysis is teaching and learning in primary school; its specific focus is the methods and classroom conditions through which critical thinking may be developed. No pupils were recruited, no instructional intervention was implemented and no quantitative outcomes were collected. The findings below should therefore be understood as a theoretically grounded synthesis and proposed teaching model, not evidence of measured effectiveness.

3. Theoretical Framework and Instructional Approaches

3.1. Conceptual foundations

Dewey associated reflective thinking with the active, persistent and careful consideration of a belief or proposed knowledge claim in light of its supporting grounds [1]. From this perspective, learning requires pupils to examine information rather than receive it passively. Vygotsky emphasised the importance of interaction and guided learning for the development of higher psychological functions [2]. In primary school, joint problem-solving, dialogue and teacher scaffolding can accordingly create opportunities for more complex reasoning.

Paul and Elder characterise critical thinking through purposeful analysis and appraisal of reasoning [3]. In classroom practice, this includes identifying a main claim, considering its grounds, examining evidence and forming a coherent conclusion. Ennis associates critical thinking with reasonable, reflective thought about what to believe or do [4], suggesting the value of tasks that ask children to explain choices and test assumptions. Facione distinguishes interpretation, analysis, evaluation, inference, explanation and self-regulation [5], providing a useful basis for describing the skills teachers may seek to foster.

For the purposes of this article, critical thinking among primary school pupils is understood as the developing ability to interpret educational information, analyse and compare evidence, explain judgments and review the outcomes of reasoning. It should not be reduced to finding faults or disagreeing with others: openness to new evidence, willingness to revise an initial position and respect for well-supported alternatives are equally important.

3.2. Problem-based learning

Problem-based learning introduces a question or situation that cannot be resolved through immediate recall alone. The teacher presents the problem, encourages hypotheses and guides pupils in finding and evaluating relevant information. For example, in an environmental studies lesson, children may investigate the question “Why do plants need light?” They propose explanations, draw on observations and justify their answers. Such inquiry links knowledge acquisition to active meaning-making and reflects Dewey’s conception of reflective investigation [1].

3.3. Purposeful questioning

The use of questions can move a lesson from recalling information towards explaining and evaluating it. Questions such as “What?”, “Who?” and “When?” establish essential facts, whereas “Why?”, “How do you explain that?” and “What evidence supports your answer?” invite deeper reasoning. Regular use of such prompts encourages pupils to articulate connections, explain causes and provide reasons, in line with the skill components discussed by Paul and Elder and by Facione [3, 5].

3.4. Comparison and classification

Comparison highlights similarities and differences; classification requires the grouping of items according to defensible criteria. Pupils might compare parts of speech in language lessons, alternative approaches to a mathematical task or the properties of natural objects in environmental studies. These activities require the identification of relevant characteristics, the formation of conceptual relationships and the justification of grouping decisions [5, 6].

3.5. Discussion and collaborative learning

Discussion helps pupils encounter different interpretations and evaluate arguments. After reading a story, for instance, a class may discuss the actions of its main character. Pupils should support their views with passages or examples and consider competing interpretations. The teacher needs to establish respectful conversational norms, ensure that all pupils can contribute and keep attention on the quality of reasons rather than on agreement alone. This approach is consistent with Lipman’s emphasis on dialogue and collaborative inquiry [7].

3.6. Graphic organisers

Concept clusters, comparison matrices and other graphic organisers can help pupils structure information, identify central concepts and make relationships visible. In a lesson on water, a class might develop a concept map showing water’s properties, its importance to humans and ecosystems, and ways of conserving it. To support critical thinking, the map should become an instrument for examining connections and contrasting ideas, not merely a visual memory aid [3, 6].

3.7. Reflective exercises

Reflection invites pupils to examine how they approached a task and what they learned. At the end of a lesson, teachers can ask: “What did I learn?”, “How did I reach this conclusion?”, “Which facts helped me?”, “What was difficult?” and “How can I check my answer?” These questions direct attention towards the process of reasoning and support the self-regulatory dimension described by Facione [5].

Each instructional approach serves a different but complementary purpose: problems stimulate inquiry; questions focus reasoning; comparison strengthens analysis; dialogue develops justification; visual representations make conceptual relationships explicit; and reflection supports self-monitoring. An integrated strategy should therefore select and combine them according to lesson content, pupils' developmental needs and intended learning outcomes.

4. Results of the Theoretical Analysis

The analysis yielded five interrelated outcomes. First, six observable components of critical thinking were identified for primary schooling: interpreting and analysing information, comparing alternatives, establishing causal relationships, supporting a claim with reasons, evaluating solutions and reflecting on the reasoning process. These components are consistent with the accounts provided by Paul and Elder and Facione [3, 5].

Second, teaching methods were organised into six groups: problem-based learning; questioning; comparison and classification; discussion and collaborative work; graphic organisers; and reflective exercises. The categories are analytical rather than mutually exclusive: a well-designed classroom task may combine several of them.

Third, enabling classroom conditions were specified. Tasks should be accessible yet intellectually challenging, appropriate to pupils' developmental stage, and accompanied by sufficient time for independent thinking. A supportive environment, respectful exchange and gradually increasing cognitive demands are essential for the proposed pedagogy.

Fourth, a five-stage instructional model was formulated, as set out below. It integrates reflective inquiry with an age-appropriate sequence of classroom actions [1, 6].

Stage	Instructional purpose
1. Activate prior knowledge	Elicit existing ideas and formulate initial questions.
2. Introduce a problem question	Pose an open, meaningful problem requiring explanation.
3. Analyse information	Examine examples, texts, observations and alternative accounts.
4. Draw and justify conclusions	Explain an answer and substantiate it with relevant reasons.
5. Reflect on the process	Review the conclusion, methods and unresolved questions.

Fifth, potential indicators for formative teacher observation were identified: the ability to recognise central information, explain causes, provide relevant arguments, compare possible solutions and check answers. These indicators are suggestions for future classroom assessment; their reliability, feasibility and sensitivity to change have not yet been established.

Taken together, the outcomes constitute conceptual integration and methodological systematisation. They are not numerical findings from a pedagogical experiment. Empirical testing, operational definitions of the indicators and a documented classroom implementation are necessary before claims about effectiveness can be made.

5. Discussion and Practical Implications

The proposed model may be adapted across reading, mathematics, language and environmental studies. Its pedagogical rationale is to make pupils' reasoning visible

through questioning, evidence and reflection. The importance of guided dialogue is consistent with Vygotsky and Lipman [2, 7], while the movement from description to analysis and evaluation corresponds to the revised cognitive taxonomy [6].

An illustrative environmental studies lesson on “Responsible Water Use” shows how the model could operate. Initially, pupils identify everyday uses of water. The teacher then asks, “What might happen if people use more water than they need?” Pupils examine practical scenarios, compare forms of water use and discuss foreseeable consequences. They formulate conclusions, suggest conservation measures and explain why those measures matter. Finally, each child identifies an action they can undertake at home or at school to reduce unnecessary water consumption.

In such a lesson, the emphasis is not limited to selecting the expected answer. The teacher also attends to the pupil’s ability to connect evidence with a claim, explore possible consequences and explain the chosen response. Evaluation may include structured observation, review of spoken contributions and written work, and examination of how pupils approach unfamiliar problems.

To investigate effectiveness in future research, a study would need clearly defined and age-appropriate assessment criteria, baseline measurement, planned implementation of the model, and repeated assessment using comparable tasks. Analysis should distinguish improvements in reasoning from general increases in subject knowledge or familiarity with the test materials. These are proposed research steps rather than procedures already carried out.

The study is limited by its conceptual design. It does not contain a systematic review with specified search or screening criteria, classroom observations, a comparison group or quantitative estimates. Accordingly, its contribution lies in organising a pedagogically plausible framework and identifying issues for empirical examination.

6. Conclusion

Developing critical thinking in primary school is an important educational objective because it supports pupils’ ability to interpret information, compare perspectives, identify causal relationships, provide reasons and review their own conclusions. This theoretical analysis has brought together relevant conceptual approaches and identified six complementary teaching methods.

A five-stage model is proposed to guide classroom design: activation of prior knowledge, introduction of a problem, analysis of information, justification of conclusions and reflection. Its potential use extends to reading, mathematics, language and environmental studies, with teacher support and age-appropriate tasks as essential conditions.

The model has not yet been evaluated experimentally. Future studies should develop and validate assessment indicators, implement the model in primary classrooms and examine changes in pupils’ critical-thinking performance over time. Such evidence is necessary to determine whether the proposed approach improves learning outcomes.

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