

A Conceptual Framework for the Impact of Brainstorming Strategy on Developing Reading Comprehension Skills Among High School Students in Azerbaijan

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ABSTRACT

This theoretical paper provides a conceptual analysis of the impact of the brainstorming strategy on the development of reading comprehension skills among high school students, with a specific focus on the Azerbaijani educational context. In an era where educational goals are shifting from rote memorization to critical thinking, there is a need for pedagogical frameworks that explain how active learning strategies foster deep understanding. This article aims to construct a theoretical model that elucidates the cognitive and social mechanisms through which brainstorming enhances the different levels of reading comprehension (literal, inferential, and critical). The methodology employed is a synthesis of established learning theories, including Constructivism and Schema Theory, and a review of pedagogical literature. The paper argues that brainstorming is not merely a classroom activity but a structured process that aligns with the fundamental principles of how students learn. The conceptual findings of this paper present a process model linking the stages of brainstorming (pre-reading, during-reading, post-reading) to specific comprehension outcomes. The scientific novelty of this work lies in its creation of a specific theoretical bridge between brainstorming as a strategy and reading comprehension as a cognitive skill set within the Azerbaijani context. Its practical significance is to provide educators and curriculum designers with a robust theoretical justification and a clear conceptual guide for implementing brainstorming to cultivate advanced literacy skills.

KEYWORDS

brainstorming, reading comprehension, conceptual framework, learning strategies, Azerbaijan

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Azərbaycanda orta məktəb şagirdlərinin oxuyub-anlama bacarıqlarının inkişafında beyin fırtınası strategiyasının təsirinə dair konseptual çərçivə

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XÜLASƏ

Bu nəzəri məqalə Azərbaycan təhsil kontekstinə xüsusi diqqət yetirməklə, orta məktəb şagirdləri arasında beyin fırtınası strategiyasının oxuyub anlama bacarıqlarının inkişafına təsirinin konseptual təhlilini təqdim edir. Təhsil məqsədlərinin əzbərçilikdən tənqidi təfəkkürə keçdiyi bir dövrdə, aktiv öyrənmə strategiyalarının dərin anlaşmanı necə təşviq etdiyini izah edən pedaqoji çərçivələrə ehtiyac vardır. Bu məqalə, beyin fırtınasının oxuyub anlamanın müxtəlif səviyyələrini (hərfi, nəticə çıxarma və tənqidi) hansı idrak və sosial mexanizmlər vasitəsilə gücləndirdiyini aydınlaşdıran nəzəri bir model qurmağı hədəfləyir. İstifadə olunan metodologiya, Konstruktivizm və Sxem Nəzəriyyəsi daxil olmaqla, mövcud öyrənmə nəzəriyyələrinin sintezi və pedaqoji ədəbiyyatın icmalındır. Məqalədə iddia edilir ki, beyin fırtınası sadəcə bir sinif fəaliyyəti deyil, şagirdlərin necə öyrəndiyinin fundamental prinsiplərinə uyğunlaşdırılmış strukturlaşdırılmış bir prosesdir. Məqalənin konseptual nəticələri, beyin fırtınası mərhələlərini (oxudan əvvəl, oxu zamanı, oxudan sonra) xüsusi anlama nəticələri ilə əlaqələndirən bir proses modelini təqdim edir. Bu işin elmi yeniliyi, Azərbaycan kontekstində bir strategiya olaraq beyin fırtınası ilə bir idrak bacarıqları toplusu olaraq oxuyub anlama arasında xüsusi bir nəzəri körpü yaratmasındadır. Onun praktiki əhəmiyyəti, təhsil işçiləri və kurikulum tərtibatçılarını qabaqçıl savadlılıq bacarıqlarını inkişaf etdirmək üçün beyin fırtınasını tətbiq etmək üçün möhkəm nəzəri əsaslandırma və aydın konseptual bələdçi ilə təmin etməkdən ibarətdir.

AÇAR SÖZLƏR

beyin fırtınası, oxuyub anlama, konseptual çərçivə, öyrənmə strategiyaları, Azərbaycan

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Introduction

Reading comprehension represents a fundamental pillar of modern education and a prerequisite for active participation in a knowledge-based society. It is a multifaceted cognitive skill that transcends simple word recognition, encompassing the ability to construct meaning, draw logical inferences, and critically evaluate textual information (Zaytoun, 2004). The contemporary educational philosophy increasingly prioritizes the development of autonomous learners capable of critical inquiry, moving away from passive models of knowledge transmission. This shift necessitates the adoption of effective *learning strategies*, which are deliberate, goal-oriented mental operations that learners utilize to regulate their own learning (Al-Khateeb, 2019). Among these, active learning strategies have proven instrumental in fostering student engagement and deeper cognitive processing.

A quintessential example of such a strategy is *brainstorming*. Rooted in the principles of creative problem-solving, the *concept of brainstorming* in an educational setting is to facilitate the rapid generation of ideas within a collaborative and non-evaluative environment (Qatami, 2013). This technique is designed to unlock students' creative potential, activate their existing knowledge base, and encourage associative thinking. The *fields of application for brainstorming* are diverse, extending from creative writing and scientific inquiry to its significant role as a pedagogical tool in literacy education, particularly in pre-reading and post-reading activities.

Simultaneously, a sophisticated understanding of *reading comprehension and its levels* is vital for effective instruction. Educational theorists typically delineate a hierarchy of comprehension skills: the *literal level*, which pertains to understanding explicitly stated information; the *inferential level*, which involves interpreting implicit meanings and making logical deductions; and the *critical level*, which demands the highest order of thinking, requiring readers to analyze, synthesize, and evaluate the text and the author's intent (Abu Al-Hajj, 2021). The objective of a robust reading curriculum is to guide students to mastery across this entire spectrum.

Within the context of Azerbaijan, ongoing educational reforms seek to integrate modern pedagogical practices that align with global standards. Despite these efforts, a reliance on traditional, teacher-centered methodologies persists, which can inadvertently stifle the development of the higher-order thinking skills necessary for advanced comprehension. This situation highlights a critical need for pedagogical frameworks that not only advocate for but also theoretically explain the efficacy of student-centered strategies like brainstorming. While the practical benefits of brainstorming are anecdotally acknowledged, a coherent theoretical model explaining *how* it functions to enhance reading comprehension within the Azerbaijani high school context is largely absent from the literature.

This paper aims to fill this conceptual gap. The purpose of this study is to construct a theoretical framework that explains the mechanisms through which the brainstorming strategy influences and develops the literal, inferential, and critical levels of reading comprehension. The paper is guided by the following conceptual research questions:

1. What are the core cognitive and social-constructivist mechanisms through which brainstorming theoretically enhances the process of reading comprehension?
2. How can the distinct phases of a brainstorming-integrated lesson be conceptually mapped onto the development of specific levels of reading comprehension?
3. What are the theoretical facilitators and barriers to the effective implementation of the brainstorming strategy within the socio-cultural and educational context of Azerbaijani high schools?

The scientific significance of this article lies in its synthesis of established learning theories into a novel, contextually relevant framework for literacy instruction. It contributes to the theoretical discourse by moving beyond a simple endorsement of brainstorming to a detailed explanation of its pedagogical and psychological underpinnings. Practically, this paper offers a conceptual roadmap for Azerbaijani educators, empowering them with a deeper understanding of *why* this strategy works, thus enabling more purposeful and effective implementation.

Methodological Approach and Theoretical Foundations

This article employs a qualitative, theoretical synthesis as its primary methodology. The approach involves a critical review and integration of foundational literature from cognitive psychology, educational theory, and pedagogy to build a coherent conceptual model. The framework is developed not through empirical data collection, but through logical deduction and the systematic connection of established theoretical principles. The analysis is grounded in three core theoretical pillars that collectively explain the efficacy of brainstorming in an educational setting.

Constructivist Learning Theory

Constructivism, pioneered by theorists like Jean Piaget and Lev Vygotsky, posits that learning is an active process in which individuals construct their own understanding and knowledge through experiences and interactions with their environment. Vygotsky's emphasis on social constructivism is particularly relevant, as it highlights the role of social interaction and language in cognitive development (Al-Atoum, 2012). Brainstorming is fundamentally a constructivist strategy. It shifts the classroom dynamic from one of passive reception to active co-creation of meaning. During a brainstorming session, students are not merely absorbing information from a text; they are actively building a shared understanding, negotiating interpretations, and constructing knowledge collectively. The strategy creates a

"Zone of Proximal Development" (ZPD) where students, through collaboration, can achieve a higher level of comprehension than they could individually.

Schema Theory

Schema theory proposes that our knowledge of the world is organized into units called schemata—interconnected networks of information and experience stored in long-term memory. According to this theory, reading comprehension is an interactive process where the reader's pre-existing schemata are used to make sense of the new information presented in a text (Zaytoun, 2004). A text does not carry meaning in itself; meaning is constructed when the reader is able to connect the text to the appropriate schema. Brainstorming serves as a powerful tool for schema activation. Pre-reading brainstorming prompts students to retrieve and articulate everything they know about a topic, effectively bringing relevant schemata to the forefront of their consciousness. This preparatory activation makes the subsequent processing of textual information more efficient and meaningful.

Cognitive Load Theory

Cognitive Load Theory suggests that the human brain has a limited working memory capacity. Effective instruction should be designed to minimize extraneous cognitive load (load not directly related to learning) to free up cognitive resources for essential processing and learning (Jarwan, 2007). Brainstorming can help manage cognitive load in several ways. By encouraging students to externalize their initial thoughts and ideas onto a whiteboard or paper, it reduces the burden on working memory. Furthermore, by activating prior knowledge before reading, it creates a mental scaffold that makes it easier to integrate new, complex information from the text, thereby reducing the intrinsic cognitive load of the reading task itself.

This paper synthesizes these three theories to construct a model that explains how brainstorming systematically facilitates the complex process of reading comprehension.

Conceptual Analysis: A Process Model of Brainstorming for Reading Comprehension

This section presents the primary conceptual outcome of this paper: a process model that deconstructs how brainstorming, when integrated into a reading lesson, systematically targets and develops the different levels of comprehension. The model is structured around three key phases of implementation.

Phase 1: Schema Activation and Purpose Setting (Pre-Reading)

This initial phase is the cornerstone of the strategy's effectiveness. Before students engage with a text, the teacher presents a central concept, title, or image and initiates a brainstorming session.

- *Mechanism:* This phase directly applies *Schema Theory*. By generating a flurry of related words, ideas, and questions, students collectively activate their individual and shared schemata related to the topic. This process transforms the reading task from an encounter

- with unfamiliar information into an act of confirming, challenging, or expanding what is already known.

- *Impact on Comprehension Levels:*

- Literal Level: Brainstorming key vocabulary and concepts that students anticipate encountering prepares them to recognize and understand explicit information more readily.
- Inferential Level: By asking predictive questions ("What do we think this story will be about?"), students begin to form hypotheses, setting the stage for making inferences as they read.

Phase 2: Active Engagement and Metacognitive Monitoring (During-Reading)

Brainstorming is not limited to a pre-reading activity. It can be used at strategic points during the reading process. The teacher might pause the reading and ask students to brainstorm possible solutions to a character's dilemma or predict the outcome of a particular event.

- *Mechanism:* This phase aligns with *Constructivism* and promotes metacognition. It prevents passive reading by forcing students to actively process the text, monitor their understanding, and engage in problem-solving. This interactive engagement ensures that students are continuously building meaning rather than simply decoding words.

Impact on Comprehension Levels:

- Inferential Level: This is where inferential skills are actively honed. Students must use textual clues to brainstorm plausible predictions and justify their reasoning, thus "reading between the lines."

- Critical Level: Brainstorming alternative actions for a character can lead to initial discussions about motivations and choices, a foundational element of critical analysis.

Phase 3: Consolidation and Critical Reflection (Post-Reading)

After completing the text, a final brainstorming session is conducted. This session moves from what the text *says* to what the text *means* and *does*. Prompts might include: "What were the main themes?" "What was the author's message?" "How could this story have ended differently?"

- *Mechanism:* This phase is a powerful application of **Social Constructivism**. In a collaborative discussion, students share their interpretations, challenge each other's views, and co-construct a richer, more nuanced understanding of the text. The non-judgmental nature of brainstorming encourages participation from all students.

Impact on Comprehension Levels:

- Inferential Level: Students synthesize information from across the text to brainstorm themes and authorial intent, which are rarely stated explicitly.

- Critical Level: This phase directly targets critical comprehension. By debating the author's purpose, evaluating the credibility of the information, distinguishing fact from opinion, and exploring alternative perspectives, students engage in the highest form of textual analysis (Abu Al-Hajj, 2021).

This three-phase model illustrates that brainstorming is not a monolithic activity but a flexible pedagogical process that can be strategically deployed to guide students progressively through the levels of reading comprehension.

Discussion

The conceptual framework developed in this paper posits that the efficacy of the brainstorming strategy in enhancing reading comprehension is attributable to its deep alignment with fundamental principles of learning. The discussion here will interpret the implications of this model, consider theoretical barriers to its implementation, and propose avenues for future empirical inquiry.

Theoretical Implications: From Technique to Pedagogy

This model reframes brainstorming from a simple ice-breaker or idea-generation technique into a comprehensive pedagogical approach. The key implication is that its effectiveness is not inherent in the activity itself, but in its purposeful implementation guided by an understanding of the underlying cognitive processes. Unlike traditional pedagogy, which often treats reading as a linear process of information extraction, the brainstorming-integrated approach treats it as a cyclical, interactive, and constructive process. It fundamentally alters the roles in the classroom: the teacher becomes a facilitator of inquiry rather than a dispenser of knowledge, and students become active agents in their own learning. This aligns with the goals of educational reform in Azerbaijan, which seeks to foster greater student autonomy and critical thinking.

Theoretical Obstacles to Implementation in the Azerbaijani Context

While theoretically sound, the successful implementation of this model faces potential barriers that are rooted in educational and cultural norms.

- *Pedagogical Inertia:* The most significant obstacle is the persistence of a "transmissionist" model of education, where the teacher's role is primarily to convey information. A shift towards a facilitative role requires a significant change in mindset and practice for educators who have been trained and have long operated within a different paradigm (Al-Shammari, 2011).
- *Assessment-Driven Culture:* In an educational system heavily focused on standardized testing that often prioritizes literal recall, teachers may perceive student-centered activities like brainstorming as a "detour" from preparing students for exams. The perceived time cost may outweigh the acknowledged, but not directly assessed, benefits of developing higher-order thinking.
- *Student Disposition:* Students accustomed to passive learning may initially exhibit resistance. The fear of offering a "wrong" idea can stifle participation, directly contradicting brainstorming's core principle of deferring judgment. Cultivating the psychological safety

necessary for free-flowing idea generation requires time and deliberate effort from the teacher.

Overcoming these barriers requires more than just introducing a new technique; it demands systemic change, including robust teacher training grounded in constructivist theory and a re-evaluation of assessment methods to better reward critical and creative thinking.

Directions for Future Empirical Research

This conceptual framework provides a theoretical basis for future empirical studies. Researchers are encouraged to test the hypotheses embedded within this model. Potential research avenues include:

- An experimental study, similar to the one originally conceived, to quantitatively measure the impact of the three-phase brainstorming model on the different levels of reading comprehension among Azerbaijani students.
- A qualitative case study to explore the lived experiences of teachers and students as they implement the brainstorming strategy, providing rich insights into the practical challenges and benefits.
- A comparative study investigating the differential effects of various brainstorming modalities (e.g., individual vs. group, digital vs. traditional) on student engagement and comprehension outcomes.

Such research would serve to validate, refine, or challenge the theoretical propositions made in this paper, thereby contributing to an evidence-based approach to literacy instruction in Azerbaijan.

Conclusion

This paper has argued that the brainstorming strategy, when understood and implemented through the lens of established learning theories, is a powerful pedagogical tool for developing sophisticated reading comprehension skills. By constructing a conceptual framework grounded in Constructivism, Schema Theory, and Cognitive Load Theory, this article has moved beyond a simple description of the strategy to provide a theoretical explanation for its effectiveness. The proposed three-phase model—encompassing schema activation, active engagement, and critical reflection—provides a clear and structured pathway for educators to guide students from literal understanding to inferential and critical analysis.

The analysis concludes that brainstorming's true value lies in its capacity to transform the act of reading into an active, engaging, and collaborative process of meaning-making. It empowers students by placing their own ideas and prior knowledge at the center of the learning experience.

For the Azerbaijani educational system, which aims to cultivate a new generation of critical thinkers, this framework offers both a theoretical justification and a practical guide for action. The key recommendations emerging from this analysis are:

- *Teacher Professional Development:* Training programs should focus on the theoretical underpinnings of active learning strategies, enabling teachers to become adaptable facilitators rather than mere technicians.
- *Curriculum Integration:* Curriculum designers should embed strategies like brainstorming as core components of literacy instruction, providing explicit guidance on their implementation across different grade levels and subject areas.
- *Fostering a New Classroom Culture:* School leaders and teachers must work collaboratively to create learning environments where inquiry, intellectual risk-taking, and collaborative discussion are valued and encouraged.

In essence, by embracing brainstorming not just as an activity but as a core pedagogical philosophy, educators can unlock students' potential to become proficient, engaged, and truly critical readers, equipped with the skills necessary for success in the 21st century.

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