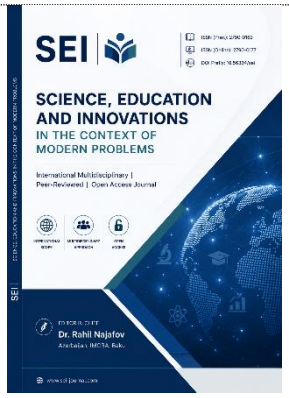

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RESEARCH ARTICLE

Creative Thinking among Preschool Children: A Comparative Cognitive-Developmental Analysis Based on Gender and Parental Educational Background in Early Childhood Education

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Keywords Creative thinking; Preschool education; Early childhood development; Cognitive development; Gender differences; Parental educational level; Educational psychology.

Abstract

Creative thinking is increasingly recognized as a fundamental cognitive competence that contributes to children's intellectual flexibility, problem-solving capacity, and future academic adaptation. Early childhood education environments play a critical role in fostering these abilities, particularly during the preschool years, which represent a sensitive developmental stage for cognitive and creative growth. The present study investigates differences in creative thinking among preschool children according to gender and parents' educational level in the preschool class at Mihi Mohamed Belhadj School in El Oued, Algeria.The study employed a comparative descriptive research design. The sample consisted of 26 preschool children aged between 5 and 6 years, including 13 males and 13 females. Participants were additionally categorized according to parents' educational level into low and high educational background groups. Data were collected using Mansi's Creative Thinking Scale (1991), which evaluates dimensions associated with originality, flexibility, fluency, and imaginative expression. Statistical analysis was conducted using independent-samples t-tests to examine group differences. The findings revealed statistically significant differences in creative thinking associated with both gender and parents' educational level. Male participants demonstrated higher mean scores in creative thinking compared with female participants. In addition, children whose parents possessed higher educational levels achieved significantly greater creative thinking scores than children from lower educational backgrounds. These findings suggest that family educational climate and socio-cognitive stimulation may substantially contribute to the development of creative cognitive abilities during early childhood. The study highlights the importance of supportive educational and family environments in enhancing children's creative potential during the preschool stage. It further emphasizes the need for early childhood educational programs that encourage exploratory learning,

imagination, cognitive flexibility, and creative expression regardless of gender or socio-economic background. The study contributes to the growing body of research on early childhood cognitive development within the Arab and North African educational context and provides practical implications for preschool educators, curriculum developers, and educational policymakers.

Citation

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INTRODUCTION

Creative thinking is widely regarded as one of the most advanced forms of human cognitive activity and an essential component of intellectual development, problem-solving ability, and adaptive functioning. In contemporary educational psychology, creativity is increasingly recognized as a critical competence that enables individuals to generate original ideas, respond flexibly to unfamiliar situations, and engage in innovative forms of reasoning. As societies continue to transition toward knowledge-based and innovation-driven systems, the development of creative thinking during early childhood has become a major educational priority.

Early childhood, particularly the preschool stage, represents a sensitive developmental period during which cognitive, emotional, linguistic, and social capacities undergo rapid transformation. During this stage, children begin to develop exploratory behavior, imaginative abilities, symbolic thinking, and cognitive flexibility, all of which constitute fundamental dimensions of creativity. Educational researchers and developmental psychologists emphasize that preschool learning environments play a decisive role in shaping children's future intellectual trajectories by fostering curiosity, experimentation, and independent thinking.

Theoretical perspectives on creative thinking have evolved considerably within the fields of psychology and education. Guilford conceptualized creative thinking as a form of divergent thinking characterized by fluency, flexibility, originality, and sensitivity to problems. Torrance further expanded this perspective by emphasizing the developmental nature of creativity and the importance of educational environments in nurturing children's creative potential. Similarly, contemporary cognitive-developmental approaches argue that creativity is not an innate characteristic restricted to exceptional individuals, but rather a dynamic ability that can be cultivated through supportive educational experiences, family interaction, and socio-cultural stimulation.

Despite the growing body of international literature on creativity in early childhood education, the socio-demographic determinants of creative thinking among preschool children remain insufficiently explored in many Arab and North African educational contexts. In particular, limited empirical attention has been devoted to examining the relationship between children's creative thinking and family-related variables such as gender socialization and parents' educational level. Existing studies suggest that parental educational background may significantly influence children's cognitive development through the provision of intellectually stimulating environments, educational support, language interaction, and opportunities for exploratory learning. Likewise, gender-related differences in socialization practices may shape children's opportunities for creative expression and cognitive engagement from an early age.

Within the Algerian educational context, research addressing creative thinking during the preschool stage remains relatively limited despite increasing awareness of the importance of early childhood education for long-term academic and cognitive development. Consequently, there is a growing need for empirical studies that investigate the factors associated with creativity among preschool children and contribute to evidence-based educational practices.

Accordingly, the present study examines creative thinking among preschool children enrolled in the preschool class at Mihi Mohamed Belhadj School in El Oued, Algeria. Specifically, the study investigates differences in creative thinking according to gender and parents' educational level. By focusing on these socio-educational variables, the study seeks to contribute to the broader literature on early childhood cognitive development while providing practical implications for preschool educators, curriculum developers, and educational policymakers.

The study is guided by the following research questions:

• Are there statistically significant differences in creative thinking among preschool children according to gender?
• Are there statistically significant differences in creative thinking according to parents' educational level?

The study hypothesizes that statistically significant differences in creative thinking exist according to both gender and parents' educational level among preschool children.

The significance of the study lies in its contribution to understanding the developmental and socio-educational dimensions of creativity during early childhood. Furthermore, the findings may support the design of educational programs and pedagogical strategies aimed at fostering creativity, imaginative thinking, and cognitive flexibility within preschool learning environments.

Research Problem and Study Objectives

Creative thinking represents one of the highest forms of cognitive activity and constitutes a fundamental dimension of human intellectual development. Within contemporary educational psychology, creative thinking is increasingly viewed as an essential competence that enables individuals to adapt to changing environments, solve complex problems, and generate innovative responses to unfamiliar situations. Early childhood, particularly the preschool stage, is considered a critical developmental period for the emergence and cultivation of creative cognitive abilities, as children begin to develop flexibility of thought, imaginative capacity, and exploratory behavior.

Despite the growing scholarly interest in creativity and early childhood cognition, the determinants of creative thinking among preschool children remain insufficiently explored within many developing and non-Western educational contexts. Existing research suggests that creative thinking is influenced by a combination of cognitive, environmental, familial, and socio-cultural variables. Among these variables, gender and parents' educational level are frequently identified as important factors shaping children's cognitive stimulation, learning opportunities, and intellectual engagement. However, empirical findings regarding the relationship between these variables and creative thinking remain inconsistent across cultural and educational settings.

Theoretical perspectives proposed by Guilford emphasize that creative thinking is characterized by originality, fluency, flexibility, and sensitivity to problems, whereas Torrance's work highlights the developmental and educational dimensions of creativity during childhood. From this perspective, preschool educational environments and family educational practices play a significant role in shaping children's creative potential. Parents with higher educational backgrounds may provide cognitively enriched environments that encourage exploration, dialogue, imagination, and problem-solving activities, thereby enhancing children's creative abilities. Similarly, gender-related socialization patterns may influence opportunities for creative expression and cognitive engagement during early childhood.

Accordingly, the present study seeks to investigate creative thinking among preschool children in the preschool class at Mihi Mohamed Belhadj School in El Oued, Algeria, by examining differences according to gender and parents' educational level. The study attempts to contribute to the growing literature on early childhood cognitive development within the Arab and North African educational context, where empirical studies on creativity during the preschool stage remain relatively limited.

The study is guided by the following research questions:

• Are there statistically significant differences in creative thinking among preschool children according to gender?
• Are there statistically significant differences in creative thinking according to parents' educational level?

Based on these questions, the study tests the following hypotheses:

H1: There are statistically significant differences in creative thinking among preschool children according to gender.
H2: There are statistically significant differences in creative thinking among preschool children according to parents' educational level.

The significance of the study lies in its contribution to understanding the socio-educational factors associated with the development of creative thinking during early childhood. The findings may provide valuable implications for preschool educators, curriculum developers, educational psychologists, and parents by highlighting the importance of supportive cognitive environments in fostering creativity among young children.

Specifically, the study aims to:

- Examine differences in creative thinking between male and female preschool children.
- Investigate the relationship between parents' educational level and children's creative thinking abilities.
- Contribute to the literature on early childhood creativity within the Algerian educational context.
- Provide educational recommendations for enhancing creative thinking during the preschool stage.

Operational Definitions

Creative Thinking: In the present study, creative thinking refers to the child's ability to generate original, flexible, and diverse responses when dealing with cognitive situations and problem-solving tasks. It is operationally measured using Mansi's Creative Thinking Scale (1991).

Preschool Children: Preschool children refer to children aged between 5 and 6 years enrolled in the preschool class at Mihi Mohamed Belhadj School in El Oued Province, Algeria.

Parents' Educational Level: Parents' educational level refers to the academic attainment of the child's parents and is categorized into two groups: low educational level (primary and middle school education) and high educational level (secondary and university education).

1. THEORETICAL FRAMEWORK

1.1 Conceptualizing Creative Thinking

Creative thinking is widely recognized as one of the most complex and multidimensional constructs in cognitive psychology and educational sciences. Over the past decades, researchers have proposed numerous theoretical interpretations of creativity, reflecting the diversity of perspectives regarding its cognitive, emotional, social, and developmental dimensions. The absence of a universally accepted definition is largely attributed to the dynamic and multifaceted nature of creativity itself.

Early theoretical approaches conceptualized creative thinking as a process associated with originality, innovation, and the generation of meaningful ideas. MacKinnon (1962) described creativity as a long-term process characterized by originality, feasibility, and intellectual productivity, emphasizing that creative achievement may emerge either spontaneously or through prolonged cognitive effort. Similarly, Ceding (1964) viewed creative thinking as the process of integrating previously unrelated elements into new forms capable of satisfying specific needs or producing socially valuable outcomes. These perspectives highlight the constructive and transformative dimensions of creativity within human cognition.

One of the most influential theoretical contributions to creativity research was introduced by Guilford (1967), who conceptualized creative thinking as a form of divergent thinking. According to Guilford, creativity is characterized by the production of multiple, varied, and original responses that extend beyond conventional patterns of reasoning. Within this framework, creative thinking involves several cognitive dimensions, including fluency, flexibility, originality, and sensitivity to problems. Guilford's model significantly influenced subsequent educational and psychological studies concerned with measuring and developing creativity among children and adolescents.

Jones (1972) further emphasized the adaptive and dynamic aspects of creative thinking by defining it as a combination of flexibility, originality, and fluency that enables individuals to move beyond routine cognitive patterns toward alternative and innovative ways of thinking. From this perspective, creative thinking is not limited to artistic expression but constitutes an essential cognitive mechanism for problem-solving and intellectual adaptation. Likewise, Leven (1976) associated creativity with the individual's ability to produce authentic and contextually appropriate responses to challenging situations, thereby linking creativity to cognitive autonomy and behavioral spontaneity.

Despite the diversity of these definitions, contemporary scholarship generally agrees that creativity cannot be reduced to a single cognitive dimension or theoretical explanation. Rather, creativity is increasingly understood as an integrated phenomenon shaped by the interaction of cognitive abilities, emotional dynamics, motivational factors, environmental stimulation, and socio-cultural contexts. Al-Daini (1996) argued that the complexity of creativity makes it difficult to establish a comprehensive and universally accepted definition, as creative behavior involves overlapping psychological and environmental variables that interact dynamically.

Similarly, Al-Zayyat (1995) identified several factors contributing to the conceptual ambiguity surrounding creativity. These include the multidimensional nature of creativity, the difficulty of predicting creative outcomes, the relativity involved in evaluating creative products, and the interaction between cognitive, emotional, motivational, and environmental variables. Consequently, modern creativity research increasingly adopts interdisciplinary perspectives that integrate cognitive psychology, developmental psychology, educational theory, and socio-cultural analysis.

In contemporary educational discourse, creative thinking is considered a fundamental twenty-first-century competence associated with innovation, adaptability, and lifelong learning. Educational systems worldwide increasingly emphasize the importance of cultivating creativity from early childhood in order to prepare learners for rapidly changing social, technological, and professional environments. As a result, creativity is now viewed not merely as an innate talent restricted to exceptional individuals, but as a developmental cognitive capacity that can be nurtured through supportive educational experiences and stimulating learning environments.

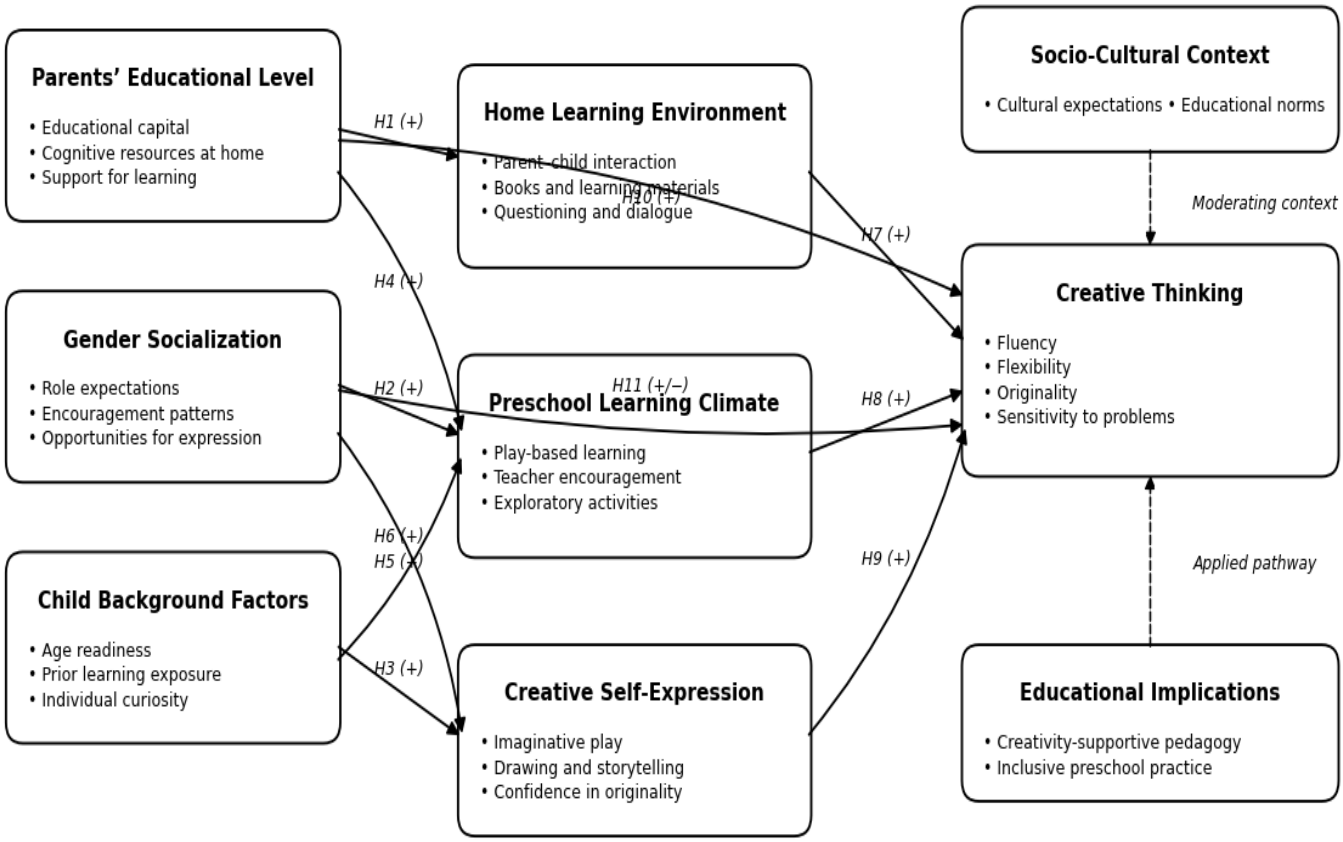
1.2 Creative Thinking in Early Childhood

Creative thinking during early childhood represents a developmental process through which children express curiosity, imagination, cognitive flexibility, and exploratory behavior. Preschool years are considered particularly important for the emergence of creative potential because children at this stage actively engage with their surrounding environment through play, experimentation, symbolic representation, and spontaneous inquiry. Developmental psychologists emphasize that children's creativity is closely associated with openness to experience, emotional expression, and the freedom to explore ideas without fear of evaluation or failure.

From a developmental perspective, creativity among children should be understood as a process rather than merely a final product. Creative expression in childhood often appears through imaginative play, storytelling, drawing, symbolic interaction, and unconventional problem-solving behaviors. Dewdek conceptualized creativity among children as a form of openness, spontaneity, and expressive freedom that evolves alongside cognitive and emotional maturation. According to this view, creativity reflects not only intellectual ability but also personality traits and adaptive interaction with the surrounding environment.

Al-Khalili further emphasized that children's creativity involves the ability to produce original and non-stereotypical ideas characterized by flexibility and imaginative variation. Importantly, creativity exists among most children to varying degrees, depending on individual characteristics, family environment, educational stimulation, and socio-cultural context. Thus, differences in children's creative thinking may emerge as a consequence of variations in environmental support, cognitive encouragement, and opportunities for exploration and independent expression.

Figure 1. Generalized Structural Equation Model (SEM) of Creative Thinking Development among Preschool Children



Caption: The figure presents a generalized Structural Equation Model (SEM) illustrating the relationships between socio-demographic factors, family educational background, preschool learning environments, and the development of creative thinking among preschool children. The model conceptualizes parents' educational level, gender socialization, and child background characteristics as exogenous variables influencing creative thinking both directly and indirectly through mediating variables such as the home learning environment, preschool learning climate, and creative self-expression. The framework additionally incorporates socio-cultural context and educational implications as complementary dimensions shaping creativity-oriented early childhood education. The model reflects contemporary cognitive-developmental and socio-educational perspectives on creativity and early childhood learning.

Source: Developed by the authors based on the theoretical perspectives of Guilford (1967), Torrance (1974), Piaget (1972), Bloom (1964), and contemporary studies in early childhood creativity and educational psychology.

Contemporary research in early childhood education similarly highlights the significant role of educational and family environments in fostering creativity during preschool years. Children who are exposed to intellectually stimulating interactions, exploratory learning experiences, supportive communication, and play-based educational activities are more likely to develop higher levels of creative thinking. Parents' educational background may additionally influence children's creativity by shaping home learning environments, language exposure, cognitive stimulation, and access to educational resources.

Within preschool educational settings, creative thinking is increasingly regarded as an essential component of holistic child development. Educational programs that encourage inquiry-based learning, imaginative exploration, collaborative interaction, and flexible thinking are considered particularly effective in supporting children's cognitive growth and creative potential. Consequently, understanding the factors associated with creative thinking during early childhood has become a central concern for educational psychologists, curriculum designers, and policymakers seeking to promote innovation-oriented educational systems.

1.3 Stages of the Creative Thinking Process

Creativity is increasingly understood as a dynamic cognitive process involving multiple interconnected stages that collectively contribute to the generation of original and meaningful ideas. Rather than occurring instantaneously, creative thinking develops through progressive mental operations that enable individuals to identify problems, reorganize information, generate innovative insights, and evaluate possible solutions. Classical theories of creativity commonly conceptualize the creative process as a sequence of successive stages that culminate in the production of a novel and socially valuable outcome.

1.3.1 Preparation Stage

The preparation stage represents the initial phase of the creative process and involves the acquisition of knowledge, information gathering, and problem identification. During this stage, the individual develops a comprehensive cognitive understanding of the subject or issue under consideration through observation, exploration, and analytical engagement. Educational psychologists emphasize that effective preparation requires intellectual curiosity, prior knowledge, and active interaction with the surrounding environment.

In this phase, individuals collect relevant data, define the problem precisely, analyze contextual factors, and examine potential relationships among ideas and experiences. The preparation stage therefore establishes the cognitive foundation upon which subsequent creative processes are constructed. Within educational settings, particularly during early childhood, exploratory learning activities and guided inquiry play an important role in supporting children's cognitive readiness for creative engagement.

1.3.2 Incubation Stage

The incubation stage refers to the period during which conscious efforts to solve a problem are temporarily suspended while unconscious cognitive processing continues. During this phase, information and experiences gathered during the preparation stage are reorganized mentally, allowing the individual to establish new associations and alternative perspectives. Although the individual may appear detached from the problem, cognitive activity continues at a subconscious level.

Researchers in creativity studies suggest that incubation facilitates the restructuring of cognitive patterns and contributes to the emergence of innovative solutions by reducing cognitive fixation and rigid thinking. In children, incubation may occur naturally through play, imaginative activities, or temporary disengagement from structured problem-solving tasks. This stage highlights the importance of psychological flexibility and mental freedom in the development of creative thinking.

1.3.3 Illumination Stage

The illumination stage, often referred to as the moment of insight or inspiration, represents the point at which a new idea or solution suddenly emerges into conscious awareness. This phase is typically characterized by the spontaneous appearance of an original idea after a period of cognitive incubation. Educational and psychological literature frequently describes illumination as the "creative spark" that enables individuals to overcome intellectual impasses and discover innovative approaches to solving problems.

The occurrence of illumination cannot be precisely predicted, as it is influenced by cognitive readiness, emotional state, environmental conditions, and prior intellectual engagement. In early childhood, moments of illumination may appear through spontaneous discovery, imaginative play, symbolic representation, or novel problem-solving behaviors. These experiences contribute significantly to children's cognitive confidence and creative self-expression.

1.3.4 Verification Stage

The verification stage constitutes the final phase of the creative process and involves evaluating, refining, and validating the proposed ideas or solutions. During this stage, the individual critically examines the feasibility, effectiveness, and applicability of the generated

solution while assessing its relevance to the original problem. Verification transforms creative insight into a concrete and observable product, whether intellectual, artistic, educational, or practical.

The criteria used for evaluating creativity vary according to the field of application, as creative expression in scientific, educational, or artistic contexts may require different standards of assessment. Within educational psychology, verification is considered essential because it enables learners to develop reflective thinking, self-evaluation skills, and cognitive responsibility. In the context of early childhood education, supportive learning environments can encourage children to test ideas, revise responses, and engage confidently in exploratory learning processes.

1.4 Obstacles to Creative Thinking

Despite the importance of creativity for cognitive and educational development, numerous factors may hinder the emergence and expression of creative thinking among children. Contemporary educational research emphasizes that creativity is strongly influenced by environmental, psychological, cultural, and institutional conditions that either facilitate or restrict imaginative and divergent thinking.

One of the primary barriers to creativity involves environmental obstacles, including overcrowded classrooms, excessive noise, limited educational resources, and the absence of stimulating learning environments. Such conditions may reduce children's concentration, curiosity, and willingness to explore new ideas. Similarly, cultural obstacles may emerge when societies discourage unconventional thinking, reject creative expression, or fail to provide recognition and encouragement for innovative behavior.

Expressive and intellectual obstacles also play a significant role in limiting creativity. Children may struggle to communicate ideas effectively or may experience difficulty organizing thoughts into coherent forms of expression. In addition, perceptual rigidity and stereotypical modes of thinking can restrict cognitive flexibility and reduce openness to alternative perspectives and novel solutions.

Emotional factors constitute another major challenge to creative development. Fear of failure, anxiety, excessive criticism, and intolerance of ambiguity may discourage children from experimenting with new ideas or engaging in imaginative activities. Educational environments that emphasize conformity and correct answers over exploration and discovery may further suppress children's creative confidence.

Researchers additionally highlight the influence of educational and social practices on creative thinking. Overemphasis on memorization, examination performance, and academic conformity may limit opportunities for divergent thinking and independent inquiry. Likewise, rigid gender-role expectations and restrictive social norms may influence children's freedom to engage in creative expression. The separation between play and learning within some educational systems may also reduce opportunities for imaginative exploration, despite the widely recognized role of play in cognitive and creative development.

DISCUSSION

The present study aimed to investigate differences in creative thinking among preschool children according to gender and parents' educational level within the context of early childhood education in Algeria. The findings revealed statistically significant differences associated with both variables, indicating that socio-educational and family-related factors play an important role in shaping children's creative cognitive development during the preschool stage.

The results demonstrated that male participants achieved significantly higher creative thinking scores compared with female participants. This finding may be interpreted within the broader socio-cultural and educational context in which children develop cognitive and behavioral patterns through family interaction, social expectations, and educational experiences. In many traditional and developing societies, boys are often encouraged to engage more freely in exploratory, independent, and risk-oriented activities, whereas girls may experience relatively more structured socialization patterns. Such differences in social interaction and behavioral expectations may influence opportunities for imaginative play, experimentation, and spontaneous cognitive expression during early childhood.

The findings of the present study are partially consistent with previous educational psychology research suggesting that gender-related differences in creative thinking may emerge during early developmental stages due to environmental and socio-cultural influences rather than inherent biological distinctions. However, contemporary creativity research increasingly emphasizes that creativity is a developmental and context-sensitive cognitive capacity that can be cultivated equally among both male and female children when educational opportunities, emotional support, and cognitive stimulation are provided in balanced ways. Consequently, the observed differences should not be interpreted as evidence of fixed gender disparities in creativity, but rather as reflections of differential developmental experiences and environmental conditions.

The study additionally found statistically significant differences in creative thinking according to parents' educational level, with children from highly educated family backgrounds obtaining higher creativity scores than children whose parents possessed lower

educational levels. This finding aligns with socio-cognitive and developmental theories emphasizing the importance of the family learning environment in early childhood cognitive growth. Parents with higher educational attainment are generally more likely to provide intellectually stimulating home environments characterized by educational dialogue, access to learning materials, language-rich interaction, and opportunities for exploration and imaginative engagement.

From a cognitive-developmental perspective, family educational capital may significantly influence children's opportunities to develop divergent thinking, curiosity, and independent cognitive exploration. Children exposed to supportive communicative practices, interactive storytelling, educational games, and problem-solving activities are more likely to develop higher levels of cognitive flexibility and originality. These findings are consistent with contemporary studies highlighting the role of parental involvement and home educational stimulation in promoting children's creativity and academic readiness during the preschool years.

The findings may also be interpreted through the theoretical perspectives of Guilford and Torrance, who emphasized that creativity involves fluency, flexibility, originality, and openness to novel experiences. Preschool children who experience cognitively enriched environments may develop stronger divergent thinking abilities because they are encouraged to explore multiple solutions, ask questions, and engage in imaginative activities without excessive restriction or fear of failure.

Furthermore, the results underscore the importance of preschool educational environments in fostering children's creative potential. Educational institutions that adopt child-centered and creativity-oriented pedagogical approaches may contribute significantly to enhancing imaginative thinking, exploratory learning, and cognitive confidence among preschool learners. Play-based learning activities, storytelling, collaborative interaction, artistic expression, and open-ended problem-solving tasks can all support the development of creativity during early childhood.

Despite the contribution of the current study, several limitations should be acknowledged. The relatively small sample size restricts the generalizability of the findings beyond the immediate educational context. Additionally, the study relied primarily on comparative descriptive analysis using independent-samples t-tests without incorporating more advanced statistical techniques such as regression analysis or structural equation modeling. Future studies involving larger and more diverse samples, longitudinal designs, and multidimensional analytical models may provide deeper insights into the developmental determinants of creative thinking during early childhood.

Overall, the findings of the present study reinforce the growing recognition that creativity is strongly influenced by socio-educational and environmental conditions during early childhood. The study highlights the need for educational systems and families to provide supportive cognitive environments that encourage curiosity, imaginative engagement, flexibility of thought, and creative self-expression among preschool children.

2. Preschool Education and Cognitive Development

2.1 The Preschool Class

The preschool class represents a foundational stage within early childhood education and serves as an essential transitional environment preparing children for formal schooling. Preschool education is designed to support children's cognitive, emotional, linguistic, physical, and social development through structured educational activities and interactive learning experiences. Unlike traditional primary education, preschool learning environments emphasize exploratory learning, play-based instruction, creativity, and experiential engagement.

Educational scholars define the preschool class as an institutional setting specifically designed for children between the ages of 5 and 6 years, where educational experiences are adapted to children's developmental characteristics and psychological needs. Preschool classrooms are typically equipped with age-appropriate pedagogical materials and interactive learning tools that encourage experimentation, communication, imagination, and cognitive flexibility.

Within the Algerian educational system, preschool education constitutes the final stage of pre-primary education and plays a critical role in preparing children for entry into formal primary schooling. Educational policies emphasize the importance of preschool education in facilitating children's acquisition of foundational literacy, numeracy, and social interaction skills while simultaneously supporting emotional adjustment and cognitive readiness.

Contemporary early childhood education frameworks increasingly recognize preschool education as a vital context for nurturing creative thinking and intellectual curiosity. Through activities involving play, storytelling, drawing, collaborative interaction, and exploratory learning, preschool classrooms provide opportunities for children to develop originality, imagination, problem-solving abilities, and independent thought. Consequently, the preschool stage is widely regarded as a crucial period for fostering children's creative and cognitive potential.

2.2 Objectives of Preschool Education

Preschool education constitutes one of the most significant stages within the educational process because it establishes the foundational cognitive, emotional, social, and behavioral capacities that shape children's future academic and personal development. Contemporary early childhood education systems are designed around carefully structured objectives aimed at supporting children's holistic growth while preparing them for successful integration into formal schooling environments.

One of the primary objectives of the preschool class is to facilitate children's transition from the family environment to primary education. This transitional function enables children to gradually adapt to institutional learning settings, social interaction with peers, classroom routines, and educational expectations. Preschool education therefore serves as an essential preparatory stage that enhances school readiness and reduces adjustment difficulties during the first years of formal education.

Preschool education additionally contributes to supporting families in the process of child development and care. Early childhood institutions provide educational and developmental opportunities that complement family socialization while simultaneously assisting working parents by creating structured and supportive learning environments for children. In this sense, preschool education performs not only an educational function but also a broader social and developmental role within society.

Another central objective of preschool education involves fostering children's cognitive and intellectual abilities through exploratory learning experiences, play-based activities, and interactive educational methods. Preschool environments encourage children to discover their abilities, develop curiosity, and engage with natural and social phenomena through observation, experimentation, and creative interaction. Such experiences contribute significantly to the development of imagination, problem-solving abilities, language acquisition, and cognitive flexibility.

Preschool education also aims to strengthen children's emotional and social development by encouraging communication, cooperation, empathy, and positive interaction with others. Through collective activities and guided social experiences, children gradually develop self-confidence, emotional regulation, and a sense of belonging within both family and community contexts. Educational researchers emphasize that emotionally supportive preschool environments contribute positively to children's psychological well-being and long-term social adaptation.

Furthermore, preschool institutions play an important role in identifying and nurturing children's individual interests, talents, and creative capacities. Educational activities involving drawing, music, storytelling, play, and artistic expression help children develop aesthetic awareness, self-expression, and imaginative abilities. Consequently, preschool education is increasingly viewed as a fundamental stage for cultivating creativity and supporting holistic child development.

2.3 Importance of the Preschool Class

The preschool class occupies a central position within early childhood education because it represents the child's first structured educational and social environment outside the family. Developmental psychologists and educational theorists consistently emphasize that experiences acquired during early childhood significantly influence later cognitive performance, emotional stability, social competence, and academic achievement.

One of the major functions of preschool education is its role in expanding children's opportunities for social interaction and communication. Preschool environments encourage children to cooperate with peers, participate in group activities, and develop interpersonal communication skills. These interactions help children learn social norms, emotional participation, collaborative behavior, and conflict resolution strategies, all of which contribute to healthy socialization processes.

Preschool education additionally supports children's linguistic and cognitive development by exposing them to enriched educational experiences involving language use, storytelling, symbolic play, early numeracy, and exploratory learning. Studies in developmental psychology indicate that children who participate in preschool education often demonstrate stronger language acquisition, improved cognitive flexibility, and enhanced readiness for formal schooling compared with children who lack such experiences.

The importance of preschool education has also been emphasized by several influential educational theorists. Bloom argued that a substantial proportion of intellectual development occurs during the early years of childhood, while Piaget highlighted the importance of early cognitive experiences in shaping children's mental schemas and conceptual understanding. Similarly, educational thinkers such as Pestalozzi stressed that preschool education contributes significantly to children's moral, emotional, physical, and intellectual development.

Research further demonstrates that preschool education positively influences children's independence, self-confidence, motor coordination, and emotional adjustment. Through structured play and guided activities, children gradually acquire self-reliance, develop fine and gross motor skills, and strengthen their ability to adapt to future educational environments. Consequently, preschool education is increasingly regarded as a critical investment in long-term educational success and human development.

2.4 Functions of the Preschool Class

The preschool class performs several interconnected educational, psychological, and social functions aimed at supporting children's overall development during early childhood.

2.4.1 Socialization Function

One of the primary functions of preschool education is socialization. The preschool environment introduces children to collective social life beyond the family context and enables them to interact with peers within a structured institutional setting. Through these interactions, children learn cooperation, communication, respect for others, and appropriate social behavior. Social adaptation acquired during preschool years contributes significantly to the development of social identity, emotional balance, and a sense of belonging to the wider community.

2.4.2 Cognitive and Mental Development Function

Preschool education plays a fundamental role in promoting children's cognitive and intellectual development. Educational psychologists emphasize that mental growth during early childhood depends heavily on the quality of environmental stimulation and interactive learning experiences. Preschool institutions therefore provide activities, educational tools, and exploratory situations that stimulate imagination, observation, memory, attention, and problem-solving abilities. Such experiences prepare children cognitively for the transition to primary education and facilitate later learning in reading, writing, and mathematics.

2.4.3 Development of Attitudes toward Work and Learning

Another important function of the preschool class is the gradual development of positive attitudes toward work, responsibility, and organized activity. During early childhood, children naturally engage with objects and activities through play. Over time, educational experiences help transform spontaneous play into purposeful and goal-oriented behavior. Through guided activities, children begin to understand concepts related to effort, responsibility, achievement, and cooperation, thereby establishing positive attitudes toward learning and productive engagement.

2.4.4 Physical and Motor Development Function

Preschool education additionally contributes to children's physical and motor development through activities designed to strengthen coordination, movement, and physical health. Educational programs commonly include play-based physical activities, manual tasks, artistic exercises, and movement-oriented learning experiences that support the development of both fine and gross motor skills. Proper nutrition, physical activity, and healthy educational environments further contribute to children's overall physical well-being and developmental readiness.

3. Practical Framework

3.1 Research Design

The present study employed a comparative descriptive research design to investigate differences in creative thinking among preschool children according to gender and parents' educational level. The descriptive-comparative approach was considered appropriate because it enables the systematic examination of naturally occurring differences between groups without manipulating the study variables. This methodological approach is widely used in educational psychology and early childhood research to explore developmental and socio-educational characteristics within real educational settings.

3.2 Study Sample

The main study sample consisted of 26 preschool children enrolled in the preschool class at Mihi Mohamed Belhadj Primary School in El Oued, Algeria, during the academic year 2025–2026. Participants were selected using an incidental sampling technique during April 2026. The sample included 13 male children and 13 female children. Participants were additionally categorized according to parents' educational level into two groups: low educational level and high educational level.

Table 1

Distribution of the Study Sample According to Gender and Parents' Educational Level

Parents' Educational Level	Male	Female	Total
High Educational Level	7	6	13
Low Educational Level	6	7	13
Total	**13**	**13**	**26**

The balanced distribution of participants across gender and parental educational background provided an appropriate comparative structure for examining group differences in creative thinking.

3.3 Research Instrument

3.3.1 Creative Thinking Scale

The study utilized the Creative Thinking Scale developed by Mansi (1991) to assess preschool children's creative thinking abilities. The scale, in its final form, consists of 84 items organized into three major sections designed to measure dimensions associated with originality, flexibility, imaginative thinking, and divergent cognitive responses.

The first section, referred to as the *Statements Test*, contains 37 items, including both positively and negatively worded statements. Scoring procedures differ according to item direction in order to ensure accurate measurement of children's responses.

The second section includes 32 items divided into two tasks intended to measure divergent and unconventional thinking. Participants are asked to generate unusual uses for familiar objects, specifically milk cartons and bed sheets. Responses are evaluated based on originality and non-repetition, reflecting children's ability to produce flexible and imaginative ideas.

The third section consists of a drawing-based creativity task containing 15 visual items represented by circles and squares. Children are asked to transform these geometric shapes into meaningful drawings. This section evaluates imaginative expression, symbolic representation, and creative visualization.

The multidimensional structure of the instrument allows for a comprehensive assessment of creative thinking by integrating verbal, cognitive, and visual dimensions of creativity.

3.3.2 Psychometric Properties of the Scale

To evaluate the psychometric adequacy of the Creative Thinking Scale within the Algerian preschool context, an exploratory sample consisting of 36 preschool children was selected incidentally from the same educational institution during March 2026.

Validity Analysis

Discriminant validity was assessed using the extreme-group comparison method. Participants with high and low creative thinking scores were compared to determine the instrument's ability to discriminate effectively between groups differing in creative ability.

Table 2

Discriminant Validity of the Creative Thinking Scale Using the Extreme-Group Comparison Method

Group	N	Mean	SD	F	Sig. (F)	t	Sig. (t)	Interpretation
High Creative Thinking Group	10	54.50	1.50	12.29	.003	9.46	.000	Significant
Low Creative Thinking Group	10	43.60	0.84					

The results presented in Table 2 indicate statistically significant differences between the high and low creative thinking groups. The obtained F value (12.29) was statistically significant at $p < .05$, indicating non-homogeneity between the comparison groups. Furthermore, the calculated t value (9.46) reached statistical significance at $p < .001$, demonstrating the instrument's strong discriminative capacity.

These findings confirm that the Creative Thinking Scale possesses satisfactory discriminant validity and is capable of effectively distinguishing between individuals with differing levels of creative thinking. Accordingly, the instrument was considered psychometrically appropriate for application to the main study sample.

3.4 Statistical Analysis

Data obtained from the study sample were analyzed using descriptive and inferential statistical procedures. Means and standard deviations were calculated to describe participants' creative thinking scores, while independent-samples t-tests were employed to examine differences according to gender and parents' educational level. Statistical significance was determined at the .05 level.

Conclusion and Recommendations

The present study examined creative thinking among preschool children by investigating differences associated with gender and parents' educational level within the context of early childhood education in Algeria. The findings revealed statistically significant differences in creative thinking according to both variables, indicating that socio-educational and family-related factors play an important role in shaping children's creative cognitive development during the preschool stage.

The results demonstrated that children's creative thinking abilities are closely associated with the quality of educational and cognitive stimulation available within both family and preschool environments. Parents with higher educational backgrounds may provide more intellectually enriching experiences characterized by dialogue, exploratory learning, access to educational resources, and encouragement of independent thinking. Similarly, socio-cultural patterns related to gender socialization may influence opportunities for creative expression, experimentation, and cognitive engagement during early childhood.

These findings support contemporary educational psychology perspectives emphasizing that creativity is not solely an innate ability, but rather a developmental cognitive capacity that can be strengthened through supportive educational practices, emotionally secure learning environments, and creativity-oriented pedagogical approaches. The preschool stage therefore represents a critical developmental period for fostering imagination, originality, flexibility, and divergent thinking among children.

The study additionally highlights the importance of integrating creativity-supportive educational strategies into preschool curricula and family educational practices. Educational institutions and parents should collaborate to provide children with environments that encourage curiosity, questioning, imaginative play, and freedom of expression in order to enhance creative potential during early childhood.

Despite the contribution of the present study, several limitations should be acknowledged, particularly the relatively small sample size and the restricted geographical context. Future studies involving larger and more diverse samples may provide broader insights into the socio-demographic determinants of creative thinking among preschool children.

Based on the findings of the study, the following recommendations are proposed:

- Investigating the relationship between creative thinking and mathematical skills among preschool children.
- Examining the association between creative thinking and linguistic development in early childhood education.
- Designing and evaluating training programs aimed at enhancing creative thinking among preschool children.
- Exploring the relationship between creative thinking, attention deficit, and hyperactivity among children.
- Investigating the relationship between intelligence level and creative thinking during early childhood.
- Conducting comparative studies examining creative thinking according to additional socio-demographic and educational variables.
- Developing preschool curricula that integrate creativity-oriented pedagogical strategies and exploratory learning activities.
- Encouraging stronger collaboration between families and preschool institutions to support children's cognitive and creative development.

DECLARATIONS

Ethics Approval and Consent to Participate

The study was conducted in accordance with the ethical principles governing educational and psychological research involving children. Permission to conduct the research was obtained from the administration of Mihi Mohamed Belhadj Primary School in El Oued, Algeria. Informed consent was obtained from the children's parents or legal guardians prior to data collection. Participation was voluntary, and confidentiality and anonymity were ensured throughout all stages of the study.

Consent for Publication

The authors declare that informed consent for publication of the research findings was obtained from the relevant participants' legal guardians, and all data included in this study were anonymized to protect participants' privacy.

Availability of Data and Materials

The datasets generated and analyzed during the current study are available from the corresponding author upon reasonable academic request.

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Competing Interests

The authors declare that they have no competing interests, financial conflicts, or personal relationships that could have influenced the work reported in this paper.

Authors' Contributions

- Largot Aicha contributed to the conceptualization of the study, data collection, statistical analysis, and manuscript preparation.
- Benhacine Younes contributed to the theoretical framework and interpretation of findings.
- Lehelli Mesbah contributed to methodological design and data organization.
- Benbordi Souad participated in literature review development and educational analysis.
- Bellamouchi Abderrazak contributed to data interpretation and revision of the manuscript.
- Mohammed Salah Djalab supervised the research process and contributed to the final academic revision of the manuscript.

All authors reviewed and approved the final version of the manuscript.

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Use of Artificial Intelligence (AI) Tools

The authors declare that artificial intelligence (AI)-assisted tools were used only for language editing, grammatical refinement, and academic formatting purposes. AI technologies were not used for data analysis, interpretation of findings, or generation of original scientific conclusions. The authors remain fully responsible for the accuracy, integrity, and originality of the content.

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