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Theories and Models of Creativity to Support Special Needs Education: A Systematic Review

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ABSTRACT

This paper presents a systematic review of existing models of creativity with specific emphasis on their relevance to special needs education. By synthesizing foundational and contemporary frameworks (including Wallas's Four-Stage Model, the Four-C Model, Csikszentmihalyi's Systems Model, Piirto's Pyramid of Talent Development, Amabile's Componential Model, Sternberg's Investment Theory, and the Triangular Theory of Creativity), the study highlights how creativity can be cultivated among learners with diverse abilities. The review reveals that while traditional models often emphasize individual cognitive processes, contemporary approaches underscore the socio-cultural and environmental factors essential for fostering creativity in inclusive classrooms. A persistent challenge is the absence of a universally accepted definition of creativity, which limits the adaptation of models to special needs contexts. Findings suggest that integrative approaches are most effective, advocating for flexible, context-sensitive frameworks that acknowledge both individual strengths and environmental supports. These insights provide implications for curriculum design, teacher preparation, and interventions aimed at nurturing the creative potential of students with special educational needs.

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1. INTRODUCTION

Creativity is a multifaceted construct that has garnered significant attention across various disciplines, ranging from psychology and cognitive science to philosophy and engineering (Moruzzi, 2020). Its pervasive influence extends to societal progress, technological innovation, and artistic expression, making its study crucial for understanding human potential and addressing complex challenges (Childs *et al*., 2022). Historically, the conceptualization of creativity has evolved from notions of divine inspiration and individual genius to more nuanced systems-based perspectives. Within the field of gifted education, creativity is recognized as a pivotal factor in identifying talent and cultivating exceptional abilities among students. It also plays a crucial role in fostering innovation and enhancing problem-solving skills in this population.

In gifted education, creativity has been recognized as a core construct, integral to identifying and nurturing exceptional abilities in students, thereby influencing pedagogical approaches and curriculum design. It has been defined by several scholars distinctively, yet a consensus on a singular, universally accepted definition remains elusive, reflecting the complexity inherent in its measurement and conceptualization (Hughes *et al*., 2018). For the psychoanalytic tradition, creativity often emerges from the sublimation of unconscious drives and conflicts, providing a means for individuals to express repressed desires in socially acceptable forms. This means that creative individuals produce creative works as a symbolic manifestation of their inner psychological landscape, offering unique insights into the human condition. In contrast, the humanistic view of creativity emphasizes self-actualization and the innate human drive to fulfill one's potential, positing that creative expression is a natural outcome of personal growth and the pursuit of meaning (Wadaani, 2015). This means that creativity is a product of individuals who are fully engaged in the process of becoming, freely expressing their unique perspectives and insights (Gaut, 2010). Meanwhile, cognitive views of creativity argue that creativity stems from cognitive processes such as divergent thinking, problem-solving strategies, and the restructuring of knowledge, emphasizing the mental operations involved in generating novel and useful ideas (Luria *et al*., 2016). Cognitivists believe that creativity is not a mysterious, ineffable quality but rather a product of systematic mental processes that can be analyzed and understood. Creative products are thus seen as the culmination of these cognitive operations, which can often involve a combination of fluency, flexibility, originality, and elaboration (Fontecha, 2021). These several views underscore the challenge in synthesizing a unified theoretical framework, yet they collectively highlight the intricate interplay of psychological, cognitive, and environmental factors in fostering creative expression. Despite this complexity, a common thread across many definitions posits creativity as the production of something both novel and useful within a given social context, often involving divergent thinking and the generation of numerous ideas (Jung *et al*., 2009; Fink *et al*., 2008). Defining creativity remains a complex undertaking, with over 60 distinct definitions existing across psychology and literature, preventing a single universally accepted framework (Reddy *et al*., 2018). Despite this definitional ambiguity, common elements such as originality, effectiveness, and context-appropriateness are frequently observed, reflecting a consensus that creative outputs must be both unique and viable (Witczak *et al*., 2024). This paper will systematically review the extant literature on models of creativity, aiming to synthesize current theoretical frameworks and identify key components that contribute to a comprehensive understanding of this multifaceted phenomenon.

2. METHODS

This systematic review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure rigor and transparency. A comprehensive search was conducted across databases such as PsycINFO, Scopus, Web of Science, and ERIC using keywords including "creativity models," "theories of creativity," "creativity frameworks," "components of creativity," "creativity definitions," and "creativity assessment". We also compared with the current literature (Széll, 2021). The inclusion criteria focused on peer-reviewed articles, dissertations, and scholarly books published in English, with no date restrictions. Priority was given to theoretical reviews and empirical studies that explicitly addressed creativity frameworks with relevance to inclusive or special needs education. Each model was analyzed for its theoretical foundations, strengths, limitations, and practical applications in supporting creativity among learners with disabilities. A thematic synthesis was then performed to identify commonalities, tensions, and gaps, especially in how creativity is defined and operationalized for diverse learners.

3. RESULTS AND DISCUSSION

3.1. Four Stages of Creativity: Wallas Model

One of the most traditional views of creativity was proposed by Graham Wallas in his 1926 work, "The Art of Thought," which outlines a four-stage model of the creative process: preparation, incubation, illumination, and verification (Sadler-Smith, 2015). For Wallas, creativity is a systematic, albeit complex, process involving a period of conscious effort followed by unconscious assimilation before a sudden insight emerges, which is then rigorously tested and refined (Yanti *et al*., 2018). As a systematic process, creativity undergoes several stages. The initial "Preparation" stage involves a conscious, deliberate effort to gather information and thoroughly investigate a problem, often requiring extensive knowledge acquisition and analysis within a specific domain (Sadler-Smith, 2015). This stage is characterized by focused mental work, where an individual consciously engages with the problem, exploring various angles and potential solutions. Following this, the "Incubation" phase involves a period of unconscious processing, during which the individual disengages from the problem, allowing the mind to work on it in the background without direct conscious effort (Sadler-Smith, 2015). This allows for novel associations and insights to form, often leading to a sudden breakthrough or "Illumination" stage, where a solution or idea spontaneously emerges into conscious awareness (Sadler-Smith, 2015). This sudden insight, often described as an "Aha!" or "Eureka!" moment, marks the appearance of the "happy idea" (Sadler-Smith, 2015). Finally, the "Verification" stage involves critically evaluating and refining the emergent idea or solution, ensuring its practicality, validity, and applicability through conscious effort and rigorous testing (Sadler-Smith, 2015).

Wallas's model, particularly its emphasis on the incubation phase, has significantly influenced creativity research by highlighting the role of unconscious thought processes in problem-solving and idea generation. The model suggests that stepping away from a problem allows for non-conscious processing, which can lead to novel solutions that conscious effort alone might not yield. This concept of "incubation effect" has been a subject of extensive empirical investigation, with studies exploring its mechanisms, such as selective forgetting of misleading cues or the reorganization of problem representations.

Despite the enduring influence of the Wallas model, it has also faced scholarly critiques and advancements. While the stages are often presented as linear, Wallas himself acknowledged that the process is more fluid, with potential for recursive loops and overlapping stages (Sadler-Smith, 2015). For instance, the incubation phase, while often

considered unconscious, can involve varying degrees of pre-conscious mental activity and an "intimation," where the individual senses an idea is forthcoming, preceding full illumination (Lubart, 2001). Furthermore, some researchers propose that Wallas's original model implicitly contained a fifth stage, "Intimation," which represents this pre-epiphany awareness, suggesting that the creative process is even more nuanced than the four widely recognized stages imply (Sadler-Smith, 2015). Meanwhile, contemporary scholars have found the four-stage description to be very superficial from a psychological perspective, as it lacks the intricate details of the cognitive and neurological processes involved in each stage. Further advancements in cognitive neuroscience have elucidated the underlying neural correlates associated with each stage, revealing dynamic interplay among various brain regions rather than a strictly sequential activation (Lubart, 2001).

3.2. Four-C Model of Creativity

Building upon foundational models like Wallas's, more recent frameworks have sought to categorize creativity into distinct levels of manifestation, with the "Four-C" model, encompassing mini-c, little-c, Pro-c, and Big-C creativity, offering a prominent example (Lubart, 2001). This model differentiates everyday creative expressions from expert-level or eminent creativity, providing a more nuanced understanding of creative development across the lifespan and various domains (Botella *et al*., 2018). This differentiation allows for a more precise analysis of the cognitive processes and environmental factors that foster creative thought at varying levels of impact and recognition. Mini-c creativity refers to the novel and personally meaningful interpretations of experiences, insights, and actions, often occurring in learning or problem-solving contexts. It emphasizes the subjective and constructive nature of understanding and is often considered the foundation for developing higher forms of creativity. Little-c creativity, conversely, pertains to everyday problem-solving and adaptive, original expressions found in daily life, such as inventing a new recipe or finding a clever solution to a household dilemma. These acts, while not necessarily groundbreaking, demonstrate an individual's capacity for imaginative thought and practical application within their sphere. In contrast, Pro-c creativity signifies professional-level expertise and creative output within a specific domain, characterized by years of dedicated practice, formal training, and recognition by peers, such as a professional artist or a seasoned engineer innovating within their field. Finally, Big-C creativity represents eminent, transformative contributions that profoundly impact an entire domain or society, recognized historically for their groundbreaking originality and lasting influence, such as the works of Albert Einstein or Leonardo da Vinci. This hierarchical model acknowledges that creativity is not a singular phenomenon but rather a multifaceted construct that manifests differently across individuals and contexts, ranging from personal insights to paradigm-shifting discoveries (Rosen *et al*., 2020).

This nuanced understanding allows researchers to tailor interventions and educational strategies more effectively, promoting specific types of creative development pertinent to individual needs and societal advancements. The Four-C model also facilitates a deeper exploration into the pedagogical approaches that foster creativity at different developmental stages, recognizing that interventions effective for mini-c might differ significantly from those required to cultivate Big-C potential (DeHaan, 2009; Kaufman & Beghetto, 2009; Rosen *et al*., 2020). This framework, therefore, provides a valuable lens through which to analyze the diverse manifestations of creativity, moving beyond a singular definition to encompass a spectrum of creative endeavors (Renzulli, 1976). Furthermore, the model implicitly highlights the dynamic and iterative nature of creative development, suggesting that individuals can

progress through these different levels, refining their creative abilities over time (Amabile & Pratt, 2016; Kaufman & Beghetto, 2009). The interactions among these levels, and the factors that enable transitions between them, remain fertile ground for further empirical investigation, particularly concerning the role of deliberate practice and environmental affordances (Sternberg, 2018).

3.3. Systems Model of Creativity

Recognizing the limitations of the Wallas model, more contemporary models have emerged, such as the Systems Model of Creativity, which posits that creativity is not solely an individual cognitive process but rather an emergent property arising from the complex interaction of individual, domain, and field factors. This model, primarily advanced by Mihaly Csikszentmihalyi, emphasizes that creativity arises from a dynamic interplay where an individual (possessing certain cognitive and personality traits) operates within a specific domain (a cultural symbol system like art or science) and whose work is judged and validated by a field (gatekeepers, critics, or experts within that domain). This systemic perspective highlights that creative outputs are not merely products of individual genius but are profoundly shaped by the cultural, historical, and social contexts in which they are developed and recognized. Specifically, Csikszentmihalyi's Systems Model defines the "individual" as the person possessing unique talents and skills who generates novel ideas, the "domain" as the established body of knowledge, symbols, and rules within a specific discipline, and the "field" as the social organization comprising experts who validate and preserve new contributions. This interaction underscores that creativity is a recursive process, wherein the individual transforms the domain, and in turn, the field recognizes and integrates these transformations, thereby perpetuating the evolution of the domain itself (Glăveanu, 2012; Glăveanu, 2010). This model broadens the understanding of creativity beyond individual cognitive processes, emphasizing the critical role of social and cultural factors in fostering and recognizing creative contributions (Glăveanu, 2010). This comprehensive framework departs from individualistic conceptualizations by integrating social, cultural, and historical elements, thereby offering a more holistic view of how creative acts are actualized and sustained within broader societal structures (Barrett *et al*., 2021).

Furthermore, within this framework, the interaction between the default mode network and the executive control network, mediated by the salience network, plays a crucial role in the neurological underpinnings of creative cognition, facilitating both divergent thought generation and convergent problem-solving within the systemic context. This tripartite interaction individual, domain, and field is essential, as creativity is seen not as an intrinsic trait of a person but as a systemic phenomenon that materializes when new ideas, developed by an individual, are accepted and integrated into a domain by a relevant field of experts. The domain provides the established structure, knowledge, and symbolic language that an individual use as a foundation for generating variations and innovations, while the field, composed of experts and gatekeepers, evaluates and legitimizes these novel contributions (Gaut, 2010).

While this systems model has been widely influential, research indicates that it provides a straightforward yet elegant structure for analyzing creativity in cultural production. This framework posits that creative acts require an individual to operate within a given domain, which represents the established body of knowledge and conventions, while the field, comprising experts, validates and integrates novel contributions into that domain. This interdependency suggests that creativity is not an isolated event but a continuous negotiation between personal ingenuity, established knowledge, and social validation. Beyond its

foundational tenets, the systems model can be effectively combined with sociological theories, such as Bourdieu's ideas on cultural production, to offer an even more comprehensive account of how creativity is produced, disseminated, and validated within specific cultural ecologies. This integration enables a deeper understanding of the societal mechanisms that shape creative endeavors, moving beyond an exclusive focus on individual psychological processes.

While this model provides a robust framework of creativity, scholars argue that it sometimes oversimplifies the dynamic and often chaotic nature of creative processes, particularly in rapidly evolving domains where traditional field and domain boundaries are blurred. Moreover, the model's emphasis on established domains and fields might not fully capture emergent forms of creativity that arise from interdisciplinary collaborations or transgressive acts challenging existing paradigms. This critique highlights the need for models that can account for the fluid and interconnected nature of contemporary creative practices, particularly those that involve novel combinations of disparate elements and contexts. Such considerations lead to models that conceptualize creativity as variations on a theme or even as arising from concept collision, particularly relevant in the context of human-AI co-creation, where new ideas emerge from combining existing ones in novel ways (Agarwal, 2023).

3.4. Piirto's Creative Process

Piirto's model, often referred to as the "Pyramid of Talent Development," extends beyond a mere process by emphasizing the multifaceted influences that nurture creative potential from childhood through adulthood. Proposed by Dr. Jane Piirto, this comprehensive model delineates the internal and external factors that contribute to the development and manifestation of creative talent, moving beyond a simplistic view of creativity as solely an inherent trait. For Piirto, creativity is a dynamic interaction between five critical factors: genetic endowment, personality attributes, talent in a specific domain, environmental influences, and chance. Genetic endowment refers to the innate predispositions that can provide a foundational aptitude for certain creative domains, though it is not deterministic on its own. Personality attributes encompass characteristics like perseverance, openness to experience, and risk-taking, which are crucial for navigating the challenges inherent in creative pursuits. Talent in a specific domain acknowledges that creative expression is often channeled through a particular area of expertise, such as music, art, or science, necessitating dedicated skill development and knowledge acquisition. Environmental influences, encompassing family, educational, and cultural contexts, significantly shape the opportunities and support available for creative development. Finally, chance, often overlooked, represents the serendipitous events or encounters that can profoundly impact a creative trajectory, sometimes leading to unexpected breakthroughs or opportunities. The intersectionality of these factors underscores the complex interplay that underpins the emergence of significant creative output, moving beyond a simplistic linear progression.

Piirto also introduced the "thorn" concept to describe a persistent, often challenging, internal drive or external obstacle that compels individuals towards creative expression, often acting as a catalyst for profound artistic or scientific breakthroughs. This concept highlights the often-paradoxical role of adversity and internal psychological pressures in fueling creative output, transforming potential impediments into motivational forces. This drive, coupled with what Piirto terms the "Five Core Attitudes" and "Seven I's," underscores the intricate blend of dispositional factors and experiential learning that collectively shape an individual's creative trajectory, moving beyond mere aptitude to encompass intentional engagement and reflective practice.

The Five Core Attitudes, which include a commitment to excellence, discipline, and a willingness to take risks, complement the Seven I's Inquiry, Imagination, Intuition, Insight, Inspiration, Incubation, and Improvisation which represent key cognitive processes essential for creative thought. These attitudes and cognitive processes, when combined with the environmental and genetic factors previously discussed, create a holistic framework for understanding how creative talent is not merely discovered but cultivated and sustained over a lifetime (Gottschalk, 1981). Meanwhile, the "Seven I's" Inquiry, Imagination, Intuition, Insight, Inspiration, Incubation, and Improvisation are essential components of the creative process that interact with the previously mentioned five factors to foster innovative outcomes. Each of these 'I's' represents a distinct yet interconnected stage or mode of cognitive engagement critical for creative production, from the initial questioning and imaginative ideation to the subconscious processing during incubation and the spontaneous generation of new ideas. For Piirto, the seven I's are deeply intertwined with core attitudes and general practices, such as the need for solitude and rituals, formal domain study, and meditative practices, which together cultivate an environment conducive to sustained creative output. This integrative perspective positions creativity not merely as a cognitive act but as a holistic developmental trajectory influenced by a complex interplay of internal predispositions, cultivated personal traits, domain-specific mastery, nurturing environments, and fortuitous circumstances (Piirto, 2021).

However, some counterarguments suggest Piirto's model, while comprehensive, might overemphasize individualistic traits and intellectual processes, potentially overlooking the significant role of collaborative and socially constructed creativity, as well as the emergent nature of creativity in dynamic systems. Furthermore, critics argue that models prioritizing individual talent may inadvertently marginalize contributions from those who facilitate or refine creative ideas without necessarily generating them initially, leading to an unbalanced and reductionist view of the phenomenon (Tatjana & Manić, 2019). This highlights a critical need to explore models that integrate the socio-cultural dynamics and systemic interactions within creative ecosystems, moving beyond person-centric views to encompass collective ideation and distributed creativity (Vuichard *et al*., 2023).

3.5. Componential model of Creativity

The Componential Model of Creativity, initially proposed by Teresa Amabile in the 1980s and subsequently refined, offers a comprehensive framework for understanding individual and organizational creativity by identifying key components necessary for creative output (Amabile & Pratt, 2016). This model posits that creativity arises from the confluence of three primary components: domain-relevant skills, creativity-relevant processes, and task motivation (Amabile & Pratt, 2016). Domain-relevant skills encompass the knowledge, technical proficiency, and talent in a particular field that an individual brings to a creative task. For instance, a composer requires extensive knowledge of music theory and instrumentation, while a scientist needs a deep understanding of their specific discipline to generate novel ideas (Amabile & Pratt, 2016). Creativity-relevant processes refer to cognitive and personality characteristics that foster novel thinking, such as divergent thinking, tolerance for ambiguity, and a willingness to take risks (Walia, 2019). For example, individuals with strong creativity-relevant skills might reframe problems or explore unusual associations to generate innovative solutions (Amabile & Pratt, 2016). Task motivation, the third component, pertains to the intrinsic desire to engage in the task for its inherent interest and challenge, rather than for external rewards or pressures, which the proponent argues is crucial for sustaining creative effort and achieving high-quality outcomes.

The dynamic componential model further elaborates on these factors, asserting that meaningful work significantly contributes to intrinsic motivation, thereby fostering sustained engagement in creative endeavors (Liang *et al*., 2022). This updated framework also emphasizes the interplay between individual creativity and the organizational environment, suggesting that an organizational culture supportive of risk-taking, open communication, and the recognition of novel ideas can significantly enhance creative outcomes (Amabile & Pratt, 2016). Recent research highlights the importance of domain knowledge and skill for organizational creativity, suggesting that complex contemporary problems often necessitate expertise across multiple domains for truly novel and useful ideas (Amabile & Pratt, 2016). Conversely, the model acknowledges that individual creative output is not solely an isolated phenomenon but is deeply embedded within a broader organizational context that can either facilitate or impede the creative process (Amabile & Pratt, 2016). This perspective underscores the necessity of fostering an organizational climate that encourages exploration and provides the necessary resources and intellectual freedom for individuals to apply their domain expertise and creative processes effectively (Amabile & Pratt, 2016).

While this model posits a different approach to creativity involving organizational culture and dynamic interactions among social factors, scholars argue that the emphasis on discrete components might not fully capture the synergistic and emergent properties of creative systems, particularly in highly collaborative or rapidly changing environments (Fortwengel *et al*., 2016; Glăveanu, 2010). This limitation suggests a need for models that account for the fluid boundaries between individual and collective creativity, as well as the adaptive nature of creative processes in response to environmental shifts. Additionally, the model's strong emphasis on intrinsic motivation, while critical, may not sufficiently account for situations where external factors, such as deadlines or incentives, significantly influence creative output, especially within organizational settings (Amabile & Pratt, 2016).

3.6. Investment Theory of Creativity

The Investment Theory of Creativity, championed by Robert Sternberg, posits that creative individuals are analogous to astute investors who "buy low and sell high" in the realm of ideas (Sternberg & Lubart, 1991). This economic metaphor suggests that creative thinkers pursue ideas that are initially undervalued or unrecognized, nurturing them until their worth is broadly acknowledged and then moving on to the next nascent concept (Sternberg, 2009; Sternberg & Karami, 2021). This theory integrates six distinct yet interconnected resources intellectual processes, knowledge, intellectual style, personality, motivation, and environmental context which collectively contribute to creative performance (Sternberg & Lubart, 1991). Intellectual processes refers to the cognitive abilities that enable individuals to generate, evaluate, and elaborate on ideas, facilitating the conceptualization and development of novel solutions (Zhang & Sternberg, 2011). Knowledge, whether tacit or explicit, provides the foundational information upon which creative insights are built, allowing individuals to identify gaps and opportunities for innovation within existing paradigms (Zhang & Sternberg, 2011). Intellectual style represents an individual's preferred way of thinking and problem-solving, with a legislative style favoring the creation of new rules and systems—often correlating with higher creative output. Personality traits, such as perseverance, a willingness to take risks, and tolerance for ambiguity, are crucial for navigating the often challenging and uncertain path of creative endeavor. Motivation, particularly intrinsic motivation, fuels the sustained effort required to overcome obstacles and realize creative potential. Finally, the environmental context, encompassing the sociocultural and physical surroundings, provides the necessary support and resources, or

conversely, imposes constraints, on creative expression (Kim & Lee, 2020; Sternberg, 2020; Sternberg & Karami, 2021; Zhang & Sternberg, 2011). Sternberg and Lubart argued that individuals who successfully navigate these six resources are more likely to exhibit significant creative output, mirroring successful investors who identify overlooked opportunities and cultivate them (Zhang & Sternberg, 2011).

Moreover, this theory posits that creativity is not merely an innate trait but a cultivated capacity, emphasizing that the six resources must converge and interact synergistically for optimal creative expression, meaning that a deficit in one resource can be mitigated by exceptional strength in another (Sternberg & Lubart, 1991). This confluence is crucial, as possessing high levels of individual resources in isolation, without the ability to integrate and utilize them effectively, will yield only modest creative performance (Sternberg & Lubart, 1991). It also suggests that not all resources are equally involved in every creative act, with some personality attributes being more critical for sustained creativity than for fleeting creative bursts (Zhang & Sternberg, 2011).

While this metaphorical model offers a comprehensive framework for understanding creativity, critics argue that the "buying low and selling high" analogy may oversimplify the complex, often non-linear, and collaborative nature of real-world creative processes. Furthermore, the emphasis on individual resources, while foundational, might not adequately capture the emergent properties of team-based creativity, where collective intelligence and dynamic interaction among diverse perspectives can generate outcomes exceeding the sum of individual contributions (Zhang & Sternberg, 2011). Additionally, while the model accounts for the environment, its focus remains largely on individual interactions with these resources, potentially understating the profound impact of social systems and cultural dynamics on fostering or hindering creative outputs (Mehta & Dahl, 2018).

3.7. Triangular Theory of Creativity

In contrast to models that emphasize individual attributes or an investment metaphor, the Triangular Theory of Creativity proposes a relational understanding, viewing creativity as emerging from the interplay among three core components: the creator, the audience, and the work itself. This dynamic interaction suggests that creativity is not solely an inherent quality of an individual or an isolated artifact, but rather a socially constructed phenomenon whose value is negotiated and affirmed through the collective judgment of an audience (Sternberg & Lubart, 1991). This perspective highlights the socio-cultural context within which creative acts are produced and evaluated, emphasizing that the "newness" and "appropriateness" of an idea are often determined by the prevailing norms and values of a given community (Glăveanu, 2009). Consequently, the theory asserts that for an idea or product to be considered creative, it must not only be novel but also accepted and integrated by a relevant audience, underscoring the iterative feedback loop between creation and reception. This implies that creativity is not just a cognitive process but also an attitudinal one, requiring openness and a willingness to advocate for novel ideas, sometimes against established norms (Sternberg, 2018). This model offers a simple understanding of creativity, positing that creative individuals demonstrate a constructive defiance of conventional ideas, actively asserting new viewpoints rather than passively accepting established norms (Sternberg, 2018). This defiance extends to one's own ingrained beliefs, the perspectives of others, and even the often-unrecognized societal zeitgeist the underlying, field-based assumptions shaping collective thought (Sternberg, 2018). This implies that creative acts are deeply embedded within a societal context, where individuals constantly engage with and often challenge existing traditions and conventions. This active re-evaluation underscores

creativity as a form of "constructive nonconformity," where individuals purposefully question and transform existing frameworks rather than merely deviating from them. However, critics argue this model, while emphasizing interaction, may still overstate individual agency in defying societal norms, potentially overlooking systemic and institutional barriers that significantly constrain creative expression for many (Kontos *et al*., 2020).

3.8. Discussion of the findings

The study's systematic review of creativity models reveals a diverse landscape of theoretical frameworks, each offering valuable insights while simultaneously exposing inherent limitations. Collectively, these models (Wallas, Four-C, Systems, Piirto's, Componential, Investment, and Triangular) underscore the multifaceted nature of creativity, yet their individual and collective shortcomings highlight the ongoing challenge of formulating a universally comprehensive understanding.

A recurring theme across several models is the tension between individualistic versus socio-cultural perspectives of creativity. While Wallas's model focuses on individual cognitive stages, and Piirto's emphasizes individual talent and internal drives, critics argue these approaches can underplay the profound impact of social interaction, collaboration, and external environmental factors (Tatjana & Manić, 2019). Similarly, Amabile's Componential Model, despite acknowledging organizational context, still primarily dissects individual components, potentially missing the synergistic and emergent properties of creative systems, especially in highly collaborative settings. The investment theory, with its focus on individual resources, also faces criticism for potentially understating the influence of social systems and cultural dynamics. This persistent emphasis on the individual in some models may inadvertently marginalize the contributions of those who facilitate, refine, or collectively contribute to creative endeavors without being the primary generators of initial ideas.

Conversely, models like Csikszentmihalyi's Systems Model and the Triangular Theory attempt to redress this imbalance by integrating external factors. The Systems Model posits creativity as an emergent property from the interaction of individual, domain, and field, recognizing creativity as a social and cultural phenomenon. However, even this comprehensive framework can be criticized for potentially oversimplifying the dynamic and chaotic nature of creative processes, particularly in rapidly evolving domains where traditional boundaries blur. The Triangular Theory further emphasizes the role of the audience and the work itself in defining creativity, framing it as a socially constructed phenomenon whose value is negotiated and affirmed collectively (Glăveanu & Tanggaard, 2014; Godart *et al*., 2020). While insightful, this model might still be seen as potentially overstating individual agency in challenging norms, overlooking systemic and institutional barriers to creative expression.

Another common critique across various models relates to their capacity to capture the fluid, non-linear, and often recursive nature of the creative process. Wallas's linear four-stage model, though foundational, is acknowledged to be an oversimplification, with the creative process often involving recursive loops and overlapping stages, and even a potential "Intimation" stage preceding full illumination (Sadler-Smith, 2015). Models that break creativity down into discrete components or stages, while offering analytical clarity, may struggle to fully account for the seamless and often unpredictable interplay of cognitive, emotional, and environmental factors that characterize real-world creative acts.

Furthermore, the general lack of a universally accepted definition of creativity poses a foundational challenge to any model, as over 60 distinct definitions have been identified. While common elements like originality, effectiveness, and context-appropriateness are

frequently observed, this definitional ambiguity suggests that each model may be capturing only a partial truth of creativity, influenced by its specific disciplinary lens (e.g., psychological, sociological, economic).

In essence, while each model reviewed provides valuable theoretical constructs—from the hierarchical differentiation of the Four-C model (Glăveanu & Kaufman, 2019) to the economic metaphor of the Investment Theory (Zhang & Sternberg, 2011) their collective analysis reveals a continued need for more integrated and dynamic frameworks. Future research and model development must strive to more comprehensively account for the complex interplay between individual cognitive processes, the socio-cultural context, environmental influences, and the often-non-linear progression of creative endeavors, moving beyond isolated components or strictly linear interpretations.

The presence of diverse models of creativity holds significant implications for gifted education, influencing how talent is identified, nurtured, and assessed within this population. These varied theoretical frameworks collectively highlight the multifaceted nature of creativity, moving beyond simplistic views and encouraging a more nuanced approach to giftedness. Specifically, the multi-stage and componential models provide frameworks for developing targeted interventions, such as fostering divergent thinking, problem identification, and persistence, which are critical for cultivating creative potential in gifted learners (Lubart, 2001). Moreover, the emphasis on environmental and social factors in models like the Systems Model underscores the necessity of creating supportive learning environments that encourage risk-taking, collaboration, and exposure to diverse perspectives for gifted students (Amabile & Pratt, 2016). Conversely, models like the propulsion model, which categorizes creative contributions based on their relationship to existing paradigms, offer insights into fostering both paradigm-reinforcing and paradigm-shifting creativity in gifted individuals, moving beyond traditional notions of giftedness (Sternberg, 1999). This necessitates a shift from solely focusing on high achievement to recognizing and developing the creative process itself, integrating creativity as a core component of gifted identification and intervention (Luria *et al*., 2016).

The systematic review aimed to synthesize and critically evaluate existing models of creativity, providing a comprehensive understanding of their theoretical underpinnings, strengths, and limitations. This synthesis underscores the complexity inherent in defining and measuring creativity, revealing a spectrum of perspectives ranging from individual-centric cognitive processes to holistic socio-cultural constructs. The review reveals a persistent challenge in developing a unified model capable of encompassing the full breadth of creative phenomena, from everyday problem-solving to revolutionary breakthroughs (Moruzzi, 2020). Despite this, the analysis reveals a discernible progression in theoretical sophistication, moving from early linear conceptions to more dynamic, interactive, and ecologically valid frameworks that acknowledge the intricate interplay of individual, contextual, and domain-specific factors (Küpers *et al*., 2018). Furthermore, a critical assessment of the literature highlights the persistent challenge of operationalizing and measuring creative output and potential, with many existing tools suffering from limitations in validity and reliability (Hughes *et al*., 2018). Consequently, future research must prioritize the development of robust, ecologically valid assessment methodologies that can accurately capture the multifaceted nature of creativity across diverse domains and populations. A key takeaway from this synthesis is that no single model offers a complete explanation of creativity, highlighting the need for integrative approaches that draw upon insights from various theoretical perspectives. Such an integrative approach would facilitate a more holistic understanding,

allowing for the development of interventions and educational strategies that cater to the diverse manifestations of creative potential.

4. CONCLUSION

This review demonstrates that creativity is a vital yet underutilized resource in special needs education. While existing models provide valuable insights into cognitive, affective, and social dimensions of creativity, most were developed for general populations and require adaptation for inclusive contexts. A common limitation is their linear or individualistic orientation, which can overlook collaborative, adaptive, and ecological dimensions crucial for learners with disabilities. Integrative approaches that combine cognitive, socio-cultural, and environmental perspectives are best suited for supporting diverse creative potentials. For educators and practitioners, this implies designing interventions that encourage divergent thinking, scaffold problem-solving, and build supportive classroom environments where learners with special needs can thrive creatively. Future research should develop and validate creativity models tailored to inclusive education, ensuring that students' unique abilities and challenges are recognized as drivers not barriers of creative expression.

5. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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