Nurturing Creativity in Indian Design Education: Insights and a Conceptual Mind Map

G. Chiranjeevi Reddy

Professor, National Institute of Fashion Technology, Hyderabad
gudimetla.reddy@nift.ac.in

ABSTRACT

This study explores the perspectives of design educators in India on creativity as a critical skill in higher education, particularly in the context of the National Education Policy (NEP) 2020. Analyzing data from 131 educators who participated in a Faculty Development Program (FDP) focused on creativity, the research assessed the current state of creative exploration, interdisciplinary collaboration, and inclusivity in educational institutions. It identified significant gaps and proposed actionable strategies for improvement. A comprehensive mind map was also developed, integrating cognitive strategies, techniques, and traits to enhance creativity among educators and students. While 63% of educators regard creativity as essential, 30% believe their institutions lack sufficient creative thinking tools. While strong support exists for interdisciplinary collaboration (80.2%) and inclusivity (93.1%), 11% of educators report inadequate opportunities for creative exploration. The study emphasizes the need for enhanced training programs to improve educators' proficiency with creative tools, the integration of design thinking and problem-solving methodologies into curricula, and the promotion of interdisciplinary projects to foster collaborative learning environments.

Keywords - Creativity Development, Design Education, Design Educators, Creative Pedagogy, Creative Methodologies.

1.   Introduction

The National Education Policy (NEP) of India, introduced in 2020, highlights the essential role of education in fostering holistic development. The NEP envisions an educational system that transcends the mere imparting of knowledge, focusing instead on nurturing creative and critical thinking skills among students. This vision aligns with the policy's broader goal of transforming the educational landscape to meet the evolving needs of society.

In the current era of information gaps and challenges, opportunities emerge to cultivate creative thinking skills. Innovation flourishes when individuals continually question assumptions, generate ideas, and refine concepts through iterative processes. This requires an environment of enthusiastic and supportive individuals who encourage exploration and experimentation (Assink, 2006). Edward de Bono (1970) emphasizes that creativity is integral to innovation and can be developed through practice. Similarly, Torrance (1979) identifies four key attributes of creativity: fluency, flexibility, originality, and elaboration, all of which are essential for enhancing creative abilities.

Design methodologies like Design Thinking and Creative Problem-Solving are particularly effective in creating innovative products, processes, and services that address societal needs. Suneetha & Suresh (2017) argue that creativity is a powerful tool for engaging students in problem-solving, enabling

innovative solutions to social and environmental challenges. Menon & Menon (2017) emphasize the importance of creativity in addressing India's developmental issues and call for greater collaboration and dialogue among stakeholders. Mishra & Pandey (2019) also highlight creative thinking as a means to develop innovative solutions to the challenges faced by rural communities in India.

Urbanization presents unique social and economic challenges, which Singh & Sharma (2018) suggest can be addressed through creative approaches. Jha & Kumar (2017) further stress the importance of community participation in implementing creative solutions, balancing development with social concerns, and leveraging traditional knowledge for innovative outcomes.

Reddy (2023) discovered that among 149 Indian design educators participating in a national Faculty Development Program (FDP) on creative thinking, only 2% were classified as "very creative," with none deemed "exceptionally creative." Approximately 60% were rated as "above average" in creative capabilities. A systematic review by Samaniego et al. (2024) underscores the rising focus on interdisciplinary approaches and experiential learning in cultivating creativity within design education. However, the review also reveals significant gaps in educators' creative capacities, largely attributed to traditional pedagogical methods favoring rote learning over creative exploration.

The OECD (2022) echoes similar findings, noting that while many educators possess "above average" creative skills, they often lack the training and resources required to achieve exceptional levels of creativity. Understanding educators' perceptions of creativity and their familiarity with tools that enhance creative thinking is crucial in addressing this gap.

This study aims to assess design educators' perceptions of creativity, the extent of creative exploration in their teaching practices, and their engagement in interdisciplinary and inclusive collaboration. Additionally, it develops a conceptual mind map of cognitive strategies and techniques to provide a structured framework for fostering creativity within design institutions. Based on this, the study outlines the following objectives:

- Assess design educators' perceptions of creativity as a critical skill.
- Evaluate the current state of creative exploration, interdisciplinary collaboration and inclusivity within educational institutions.
- Develop a comprehensive conceptual mind map that integrates cognitive strategies, techniques and traits to enhance creativity.

2.   Research Methodology

The research adopts a descriptive and exploratory approach, using a survey questionnaire to gather data on design educators' perceptions of creativity. The methodology includes reviewing literature on creativity, covering traits, essential attributes, cognitive strategies, and techniques. A comprehensive mind map was created to organize these insights and address gaps in existing frameworks for assessing creativity.

2.1. Participant Demographics and Objective Indicators

The study comprised 131 participants, selected from an initial pool of 200 educators who registered for an online training program on creativity, organized by the National Institute of Fashion Technology (NIFT) in July 2021. This program was supported by the AICTE Training and Learning Academy, under the Government of India. The cohort consisted of 44 men and 87 women, holding diverse roles such as professors, teachers, and lecturers, with professional experience ranging from 0 to 30 years (mean: 10.3 years). Participants represented a range of specializations, including fashion design, accessory design, architecture, engineering, and education, and hailed from 30 distinct educational institutions across India.

2.2. Survey Questionnaire

The survey employed a four-point Likert scale questionnaire, with response options ranging from "Strongly Disagree" to "Strongly Agree." The questionnaire was organized into two key sections: general perceptions and specific characteristics of creativity. The present analysis focuses on general perceptions of creativity. Given the exploratory nature of the study, the assessment of the questionnaire's validity and reliability was deemed unnecessary and thus not conducted.

2.3. Data Analysis and Interpretation

The data were analyzed using SPSS, with descriptive statistics employed to identify trends and insights. The results were then visually represented through pie charts, created in Microsoft Excel for enhanced graphical clarity. Additionally, to further illustrate the cognitive strategy development process, a detailed mind map was constructed using MindMeister, an online software supporting visual brainstorming and idea mapping. This tool aided in organizing complex information and highlighting key relationships within the data, providing a comprehensive view of the findings. Assistance from ChatGPT was utilized throughout this process, helping to enhance comprehension of the results and refine sentence structure for improved clarity and coherence, in adherence to APA formatting standards.
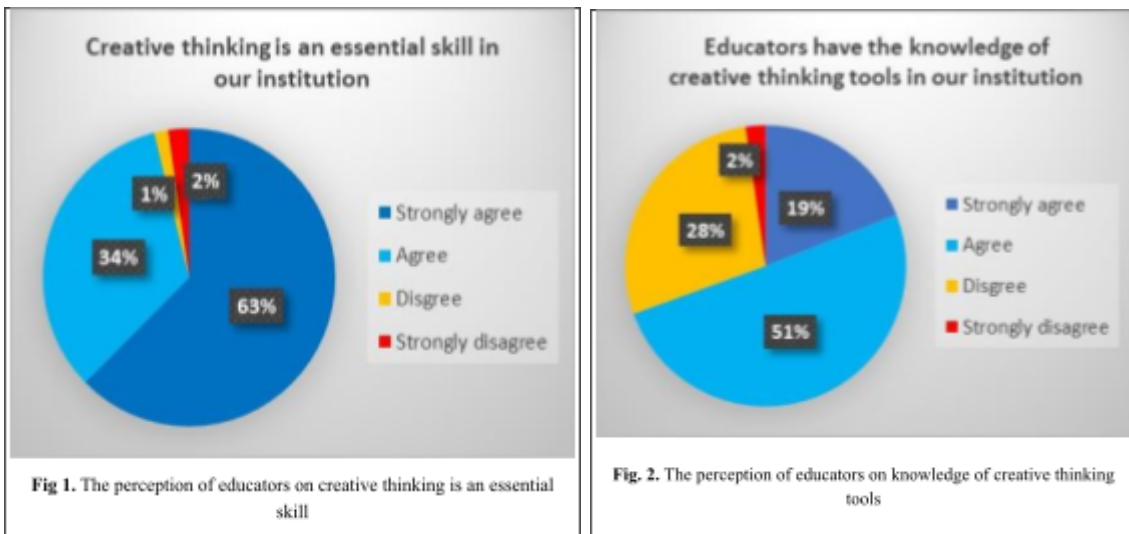
3. Perceptions of Design Educators About Creativity

This section explores the significance of creativity in teaching and examines the extent to which educators are equipped with the knowledge and tools necessary to integrate creative approaches into their work.

Fig. 1 displays that most participants (63%) strongly agreed that creativity is an essential skill, while 34% just agreed. A small percentage (3%) disagreed or strongly disagreed, indicating the need for increased awareness about the importance of creativity among all educators. Fig. 2 shows that 30% of educators believed that teachers in their institution lacked knowledge of creative thinking tools.

The findings indicate that while the majority of educators recognize creativity as a crucial skill, there remains a small proportion who do not fully acknowledge its importance. Additionally, a significant number of educators feel they lack knowledge of creative thinking tools, highlighting an existing gap in their familiarity with these resources. These results underscore both the broad acknowledgment of

creativity's value and the notable need for improved knowledge about creative thinking tools among educators

Fig 1. The perception of educators on creative thinking is an essential skill

Fig. 2. The perception of educators on knowledge of creative thinking tools

4.   Creative Exploration and Collaboration in Design Education

In the pursuit of fostering a dynamic educational environment, understanding how creative exploration and collaboration are perceived and facilitated is crucial. This section presents survey findings on creative exploration and collaboration within the institution. It examines perceptions of challenging tasks, interdisciplinary collaboration, and inclusivity among educators.

The survey results from Fig. 3 indicate that while a majority of students and employees view challenging tasks as opportunities for creative exploration, there is room for improvement. With 35.9% strongly agreeing and 57.3% agreeing, the level of strong agreement could be higher. The 6.1% who disagreed and 0.8% who strongly disagreed highlight areas where further encouragement is needed. Increasing the proportion of strong agreement could enhance the institutional culture, making challenging tasks a more universally embraced opportunity for creativity and innovation.

The results from Fig. 4 show that while a substantial portion of respondents (32.1% strongly agree and 48.1% agree) acknowledge that the institution promotes interdisciplinary student-teacher collaboration, there is still considerable room for improvement. The 19.1% who disagreed and 0.8% who strongly disagreed indicate that not all respondents perceive this support equally. To strengthen interdisciplinary efforts, increasing the percentage of strong agreement would foster a more inclusive and collaborative environment across the institution.

The survey results from Fig. 5 indicate a culture of inclusivity among design educators in formal meetings. A notable 93.1% of respondents (65.6% agreeing and 27.5% strongly agreeing) believe that different viewpoints are accepted in these settings. Only 6.9% disagreed, and none strongly disagreed, highlighting a generally positive environment. This openness to diverse perspectives suggests a

collaborative and supportive atmosphere, crucial for fostering creativity and innovation in educational contexts.

The survey results from Fig. 6 reveal that while many teachers feel they have some opportunity to explore new ideas amid their routines, there is potential for improvement. With 27% strongly agreeing and 62% agreeing, the overall positive sentiment indicates room for greater support. The 11% who disagreed and 1% who strongly disagreed suggest that not all teachers feel adequately supported in this aspect. Enhancing the proportion of strong agreement could better enable teachers to integrate new ideas into their routines, fostering a more innovative and creative educational environment.
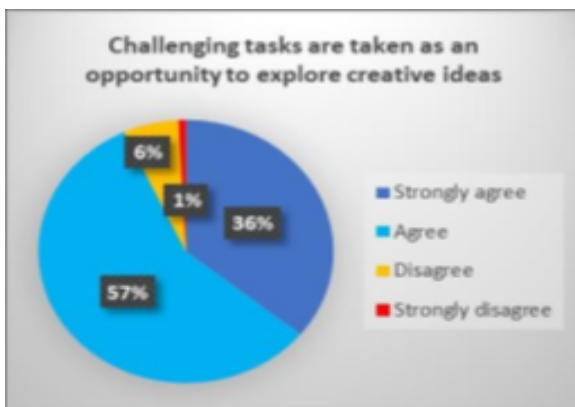
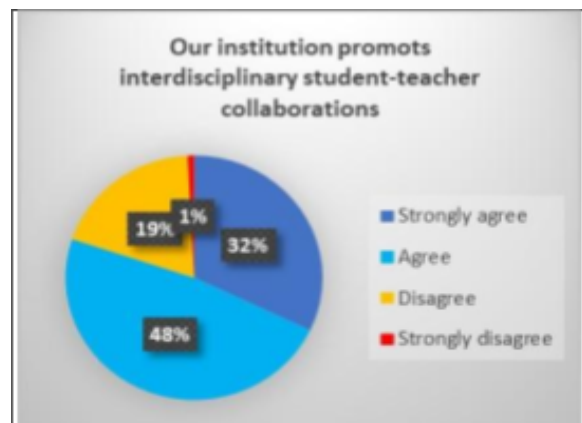Fig. 3. The perception of educators on accepting challenging tasks

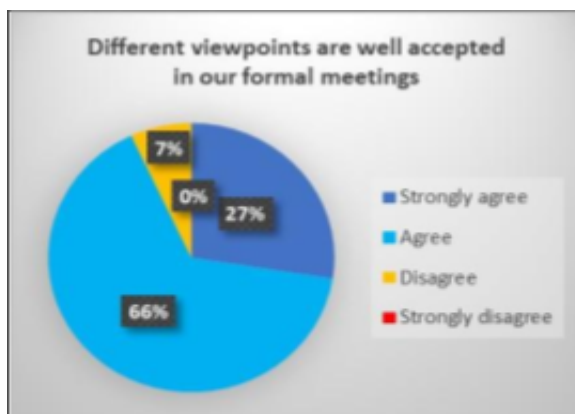Fig. 4. The perception of educators on interdisciplinary collaborations

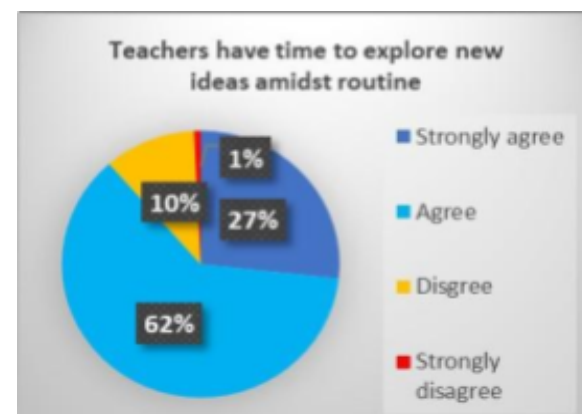Fig. 5. The perception of educators on the conduciveness to different viewpoints

Fig. 6. The perception of educators on time to explore new ideas

Despite the positive outlook, each finding indicates that there is room for improvement. For instance, while many see challenging tasks as opportunities, a smaller proportion strongly agrees, suggesting a need for more robust encouragement. Similarly, the need for enhanced time management and better promotion of interdisciplinary collaboration highlights gaps that need addressing. The common thread across the results is the institution's emphasis on inclusivity, creativity, and collaboration. However, achieving a higher level of consensus and stronger agreement across all aspects could lead to a more uniformly supportive environment, which is essential for maximizing creativity and effective collaboration. The findings from the survey underscore the need for more effective integration of creative thinking tools and interdisciplinary collaboration among educators. While a majority recognize the value of creativity, there remains a notable gap in educators' knowledge of creative thinking resources. Furthermore, though institutions are promoting creativity and collaboration, the varying levels of agreement across different areas—such as challenging tasks, interdisciplinary efforts, and inclusivity—indicate inconsistencies in how these initiatives are perceived and implemented. To address these challenges, a comprehensive conceptual mind map would serve as a strategic tool for enhancing creativity and collaboration in educational settings.

A conceptual mind map can facilitate better understanding and application of creative thinking by visually organizing and connecting key concepts, processes, and tools. Mind maps are known to promote deeper cognitive engagement, making abstract ideas more accessible and manageable. By offering a holistic view of creative processes and their applications across disciplines, a mind map can bridge the knowledge gap identified in the survey, helping educators develop a shared understanding of creative thinking tools.

Moreover, a conceptual mind map can foster interdisciplinary collaboration by illustrating how different fields intersect in creative problem-solving. It encourages educators from diverse backgrounds to see the connections between their disciplines, leading to more collaborative and inclusive educational environments. The use of mind maps has been shown to enhance memory retention, idea generation, and group collaboration, all of which are critical for fostering innovation in educational institutions (Buzan & Buzan, 2010). With these benefits in mind, the development of a comprehensive conceptual mind map becomes essential for fostering creativity in educational institutions.

5.   Development of A Comprehensive Conceptual Mind Map

A comprehensive understanding of creativity involves exploring various interconnected components, including cognitive strategies, essential attributes, creativity techniques, design processes, problem-solving tools, and key creative traits. At the core of creative cognition are thinking patterns such as divergent and convergent thinking, which facilitate the generation and refinement of ideas into practical solutions (Runco, 2014). Cognitive strategies such as inductive, deductive, and abductive reasoning guide logical analysis, while far and deep thinking encourages detailed exploration of problem-solving, and lateral thinking addresses issues from unconventional perspectives (Guilford, 1967; Dorst, 2015; Sawyer, 2012).

Creativity techniques, including brainstorming, mind mapping, and lateral thinking, enhance idea generation and foster innovative problem-solving (Puccio, Mance, & Barbero Switalski, 2018). Methods like randomization, welcoming unexpected ideas, and challenging assumptions further promote cognitive flexibility and openness (Michalko, 2006; Kelley & Kelley, 2013). Synthesis in creative thinking involves integrating diverse ideas, concepts, and perspectives to create cohesive and innovative solutions. This process encourages individuals to combine elements from various disciplines, fostering a deeper understanding and the generation of novel insights (Kolko, 2010; Cross, 2011). Effective synthesis not only enhances creativity but also supports the iterative nature of design thinking, where ideas are continually refined and developed through collaboration and feedback (Brown, 2009). By facilitating connections between seemingly unrelated concepts, synthesis plays a crucial role in problem-solving and innovation, enabling educators and practitioners to address complex challenges in more holistic ways (Sawyer, 2012; Dorst, 2015). Design methodology provides a structured framework for translating ideas into practical solutions, involving stages such as research, ideation, prototyping, and testing (Cross, 2011). Design thinking, with its focus on empathy, iterative ideation, and testing, enhances this process (Brown, 2009).

Creative problem-solving tools, such as SCAMPER and Six Thinking Hats, provide structured approaches to addressing complex challenges and exploring diverse perspectives (Cropley & Cropley, 2022). These tools, along with brainstorming, role play, and reverse thinking, enable structured idea exploration and uncover hidden insights (Sawyer, 2012; Osborn, 1953). Additionally, narrative techniques help communicate ideas and inspire creativity, making complex concepts more relatable (Gottschall, 2012).

Essential creative attributes—fluency, flexibility, originality, and elaboration—are essential for fostering creativity. Fluency refers to generating a wide range of ideas, while flexibility involves adapting approaches to suit different contexts. Originality emphasizes novel thinking, and elaboration transforms initial concepts into fully realized outcomes (Guilford, 1967; Torrance, 1974; Morrison, 2007). Nurturing these attributes allows individuals to apply cognitive strategies more effectively.

Moreover, creative traits such as curiosity, open-mindedness, and risk-taking play a critical role in enhancing the creative process (Csikszentmihalyi, 1996; Brown, 2009; Reddy, 2023). Understanding and developing these traits, in combination with cognitive strategies, creativity techniques, and tools, fosters a dynamic approach to creativity, promoting innovation and effective problem-solving across disciplines.

Despite the growing recognition of creativity's importance in education and professional fields, comprehensive frameworks for assessing and improving creative skills remain limited. The following visual representation offers a structured approach to creativity development, addressing this gap and supporting creativity across disciplines.
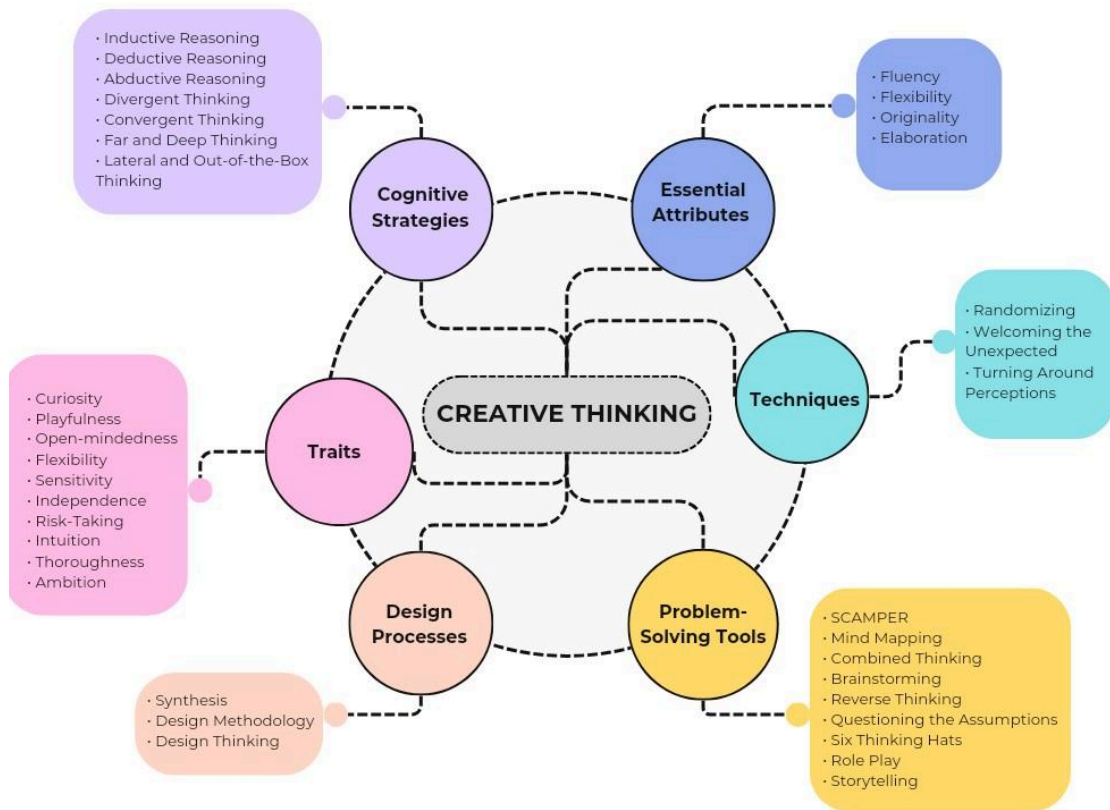
Fig. 7. Comprehensive conceptual mind map for awareness and identifying areas for improvement in creative thinking.

Although the significance of creativity in education and professional practice is widely acknowledged, a comprehensive mind map for assessing and improving awareness of creative methodologies remains lacking. The provided pictorial representation aims to address this gap by offering a visual tool to enhance understanding and application of creativity. This mind map serves as a valuable resource for educators, professionals, and students seeking to deepen their engagement with creativity and optimize their problem-solving approaches.

6. Conclusions

This study highlights the vital role of creativity in Indian design education, aligning with the objectives of the National Education Policy (NEP) 2020. Findings indicate that a majority of educators (63%) recognize creativity as an essential skill, with an additional 34% agreeing on its importance. However, 30% of educators feel their institutions lack sufficient knowledge of creative thinking tools. While many educators view challenging tasks as opportunities to foster creativity, there remains scope for stronger consensus. Although 80.2% acknowledge the encouragement of interdisciplinary collaboration, 19.1% do not, suggesting a need for further institutional support. Inclusivity appears strong, with 93.1% of educators feeling that diverse viewpoints are welcomed in formal meetings; however, 11% still feel inadequately supported in exploring new ideas.

The conceptual mind map developed in this research integrates cognitive strategies, creativity techniques, essential attributes, and key traits to enhance creativity among both educators and students. This structured tool helps identify gaps and develop creative skills critical for addressing contemporary educational and societal demands.

These findings underscore the need for enhanced training programs to boost educators' proficiency with creative thinking tools, the integration of design thinking and problem-solving methodologies into curricula, and the promotion of interdisciplinary projects to enrich collaborative learning. Such measures can help bridge existing gaps, foster an innovative educational culture, and better prepare students to meet future challenges with creativity and resilience.

Educators can effectively use the mind map in curriculum design and classroom activities, enhancing students' creativity and problem-solving skills. By embedding components such as cognitive strategies, creativity techniques, and key traits into course outcomes, educators provide a pathway for students to develop skills like flexibility, originality, elaboration and fluency. Activities centered on brainstorming, lateral thinking, and synthesis encourage hands-on learning and active engagement. Problem-solving workshops using tools like SCAMPER and "Six Thinking Hats" foster diverse perspectives. Collaborative sessions structured around mind mapping and brainstorming promote team-based ideation. Altogether, the Comprehensive conceptual mind map serves as a valuable resource in design education, supporting the development of creative skills.

Acknowledgment

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