SARGA : JOURNAL OF ARCHITECTURE AND URBANISM
VOLUME 16 NO 1 JANUARY 2022
P-ISSN: 0853-4748 E-ISSN: 2961-7030
Journal Home Page: https://jurnal2.untagsmg.ac.id/index.php/sarga

PROBLEM-BASED LEARNING AND MIND MAPPING: BOOSTING CREATIVITY IN ARCHITECTURE EDUCATION

| Received December 2nd 2021 | Accepted January 14th 2022 | Available online January 31th 2022 |
| DOI 10.56444/sarga.v16i1.1151 | Page 68 - 81 |

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ABSTRACT

This paper focuses on unlocking the creative potential of architecture students through an exploration of the Four C model of creativity. This model extends the traditional understanding of creativity and offers a comprehensive framework for fostering innovation in architecture. It introduces "mini-c" and "Pro-c" dimensions, highlighting creativity within the learning process and the attainment of professional expertise. Architecture demands a blend of technical skills and artistic expression for effective communication of ideas. However, nurturing creative thinking among architecture students faces challenges, including fear of experimentation and traditional teaching methods. To address these obstacles, the paper suggests integrating problem-based learning (PBL) and mind mapping techniques. PBL encourages collaboration and critical thinking, while mind mapping stimulates visual and associative thinking, aiding idea generation and organization. Additionally, the role of technology in architecture education is explored, emphasizing the benefits of mixed learning environments that enhance collaboration and creativity. Embracing technology readiness equips students with tools to tackle real-world challenges and create innovative designs. In conclusion, this paper underscores the importance of creative thinking in architectural design and its implications for the discipline's future. By adopting the Four C model, implementing PBL with mind mapping, and leveraging technology, educators can revolutionize architecture education, nurturing a new generation of architects prepared to shape the evolving world with imaginative and visionary designs.

Keywords: creativity; architecture; education; problem-based learning; mind mapping

ABSTRAK

Makalah ini berfokus pada membuka potensi kreatif mahasiswa arsitektur melalui eksplorasi model kreativitas Four C. Model ini memperluas pemahaman tradisional tentang kreativitas dan menawarkan kerangka kerja yang komprehensif untuk mendorong inovasi dalam arsitektur. Ini memperkenalkan dimensi "mini-c" dan "Pro-c", menyoroti kreativitas dalam proses pembelajaran dan pencapaian keahlian profesional. Arsitektur menuntut perpaduan keterampilan teknis dan ekspresi artistik untuk komunikasi ide yang efektif. Namun, memelihara pemikiran kreatif di kalangan mahasiswa arsitektur menghadapi tantangan, termasuk takut bereksperimen dan metode pengajaran tradisional. Untuk mengatasi hambatan ini, makalah ini menyarankan untuk mengintegrasikan pembelajaran berbasis masalah (PBL) dan teknik pemetaan pikiran. PBL mendorong kolaborasi dan pemikiran kritis, sementara pemetaan pikiran merangsang pemikiran visual dan asosiatif, membantu generasi ide dan organisasi. Selain itu, peran teknologi dalam pendidikan arsitektur dieksplorasi, menekankan manfaat dari lingkungan belajar campuran yang meningkatkan kolaborasi dan kreativitas. Merangkul kesiapan teknologi melengkapi siswa dengan alat untuk mengatasi tantangan dunia nyata dan menciptakan desain yang inovatif. Sebagai kesimpulan, makalah ini menggarisbawahi pentingnya pemikiran kreatif dalam desain arsitektur dan implikasinya terhadap masa depan disiplin. Dengan mengadopsi model Four C, menerapkan PBL dengan pemetaan pikiran, dan memanfaatkan teknologi, pendidik dapat merevolusi pendidikan arsitektur, memelihara generasi baru arsitek yang siap untuk membentuk dunia yang berkembang dengan desain imajinatif dan visioner..

Kata kunci: konsep, desain, arsitektur, proses, karya

INTRODUCTION

Creativity is an essential aspect of education, particularly in fields such as architecture. The Four C model of creativity, proposed by (Kaufman & Beghetto, 2009), expands the traditional dichotomy of everyday creativity ("little-c") and eminent creativity ("Big-C") by introducing two additional dimensions: "mini-c" and "Pro-c." Mini-c refers to the creativity inherent in the learning process, while Pro-c represents professional-level expertise in any creative area. This model allows for a more comprehensive understanding of creativity and its development (Kaufman & Beghetto, 2009). In the context of architecture education, creativity is crucial for students to excel in design. Architects are expected to possess artistic skills and knowledge that enable them to effectively communicate their ideas through sketching, drawing, model making, and rendering (Alnema & Dabdoob, 2022). However, there is a need to improve students' creative thinking skills in this field. Istianah emphasizes the importance of creative thinking for students to solve problems in an ever-changing world (Awalia et al., 2022). Researchers have recognized the significance of nurturing students' creative thinking in design education, as it is a crucial aspect of architectural design (Park & Kim, 2021). Various methods have been explored to stimulate students' creative thinking, including critical design thinking and the use of filmic spaces as visual communication tools (E. C. Park & Kim, 2021).

To enhance students' creative thinking skills, educators can consider implementing effective learning models and methods. Problem-based learning (PBL) with mind mapping has been found to be effective in developing creative thinking skills and collaboration among students (Sekarini et al., 2020). Additionally, technology preparedness in a mixed learning environment can contribute to the improvement of collaborative and creative thinking skills (Fideli & Aliazas, 2022). However, it is important to address the factors that may hinder students' creative thinking abilities. Some of these factors include students' fear of trying new things, conventional teaching methods, and a focus on memorization rather than the process of discovering concepts (Sekarini et al., 2020). By addressing these factors and implementing effective teaching strategies, educators can help students develop and enhance their creative thinking skills in architecture and other creative fields.Creativity plays a vital role in architecture education. The Four C model of creativity provides a comprehensive framework for understanding and developing creativity. Educators can employ various strategies, such as problem-based learning, technology integration, and the use of visual communication tools, to enhance students' creative thinking skills. By addressing the factors that hinder creative thinking and promoting a conducive learning environment, educators can foster the growth of creative and innovative architects.

THEORY FRAMEWORK

Creativity and The Psychology

Creativity is a multifaceted psychological phenomenon that has gained increasing attention in the field of psychology (Forgeard et al., 2013). While creativity has historically received less attention in psychology, there is a growing interest in understanding the psychological factors that influence and motivate creativity (Grant & Berry, 2011). Scholars and practitioners are actively exploring the antecedents and consequences of creativity, as well as the factors that contribute to creative outcomes (Hyun et al., 2020). One important psychological factor that influences creativity is creative self-efficacy, which refers to an individual's belief in their ability to generate creative ideas and solutions. Research has shown that creative self-efficacy is

positively associated with creativity-relevant outcomes, such as increased involvement in creative work (Hyun et al., 2020). This suggests that individuals who have a strong belief in their creative abilities are more likely to engage in creative activities and produce innovative ideas.

Psychological safety is another significant psychological factor that influences creativity. It refers to the perception of a safe and supportive work environment that encourages risk-taking and innovation (Mehmood et al., 2021). Studies have demonstrated that psychological safety plays a crucial role in stimulating employee creativity (Mehmood et al., 2021). When employees feel psychologically safe, they are more likely to take risks, share ideas, and engage in creative problem-solving. Additionally, psychological capital, which encompasses positive psychological resources such as optimism, resilience, and self-efficacy, has been found to be positively associated with creativity (L. Huang & Luthans, 2014). Individuals with higher levels of psychological capital are more likely to exhibit creative behaviors and generate innovative ideas. This suggests that cultivating positive psychological resources can enhance creativity.

Furthermore, the role of leadership in fostering creativity has been explored in the literature. Transformational leadership, characterized by inspiring and motivating followers, has been found to have a positive impact on employee creativity (Ma & Wan, 2018) (Ma & Wan, 2018). Transactional leadership, which involves providing rewards and incentives, has also been found to be positively related to creative behaviors (Ma & Wan, 2018). These findings suggest that different leadership styles can influence employee creativity through various mechanisms, such as psychological empowerment. The psychology of creativity is a complex field that encompasses various psychological factors and processes. Creative self-efficacy, psychological safety, psychological capital, and leadership styles are all important factors that influence creativity. Understanding these psychological factors can provide insights into how to foster and enhance creativity in individuals and organizations.

Wisdom, Intelligence, and Creativity

Wisdom, intelligence, and creativity are integral components of the educational process (J. Huang & Xiang, 2019). These qualities not only contribute to academic success but also equip students with the essential skills needed for personal and professional growth in the 21st century (Luştrea et al., 2018). Educational leaders must prioritize wisdom as it encompasses the ability to seek a common good and make decisions that benefit all individuals involved (Elbaz & Haddoud, 2017). Moreover, intelligence plays a critical role in the educational process as it includes analytic ability, problem-solving skills, and logical thinking (Fatt, 2004). Intelligence alone, however, is not sufficient. Creativity is equally important in education as it enables students to think outside the box, develop innovative solutions, and explore new perspectives (Rahimi & Shute, 2021). Through integrating wisdom, intelligence, and creativity in education, students can develop a holistic skillset that prepares them for the challenges they may face in an ever-changing world (Sternberg, 2018).

Furthermore, education should not only focus on intellectual intelligence but also on spiritual intelligence and emotional intelligence (Awaru et al., 2022). These additional forms of intelligence contribute to a well-rounded individual who can navigate social interactions, understand their own emotions, and develop empathy and compassion for others (Barragán Martín et al., 2021). By integrating wisdom, intelligence, and creativity into the education

process, students are equipped with the tools to navigate the complexities of the information age (Zhang & Zhang, 2022). This includes navigating the vast amount of information available, critically evaluating sources, and utilizing technology effectively. By adapting existing education to prioritize wisdom, intelligence, and creativity, we can create a learning environment that promotes critical thinking, problem-solving skills, and social (Nepal, 2022).

Beyond Big and Little: The Four C Model of Creativity

The Four C Model underscores that creativity is not confined solely to extraordinary breakthroughs of genius but rather exists in various degrees across diverse contexts. It emphasizes that creativity is a multifaceted and evolving process that can be fostered and developed at different levels, ranging from everyday activities to exceptional achievements, see. Figure 1 above.

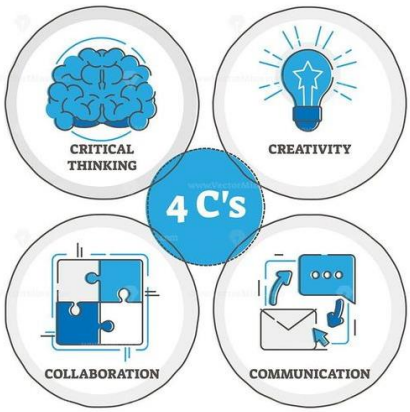

Figure 1. Diagram of the 4 C's and their supporting elements. Picture by, Vectormine

The "Four C Model of Creativity," also referred to as the "4Cs of Creativity," is a theoretical framework introduced by James Kaufman and Ron Beghetto in their 2009 paper titled "Beyond Big and Little: The Four C Model of Creativity"(Kaufman & Beghetto, 2009). This model delineates four distinct stages or components within the creative process:

- Mini-c: Mini-c pertains to "little-c" creativity, encompassing everyday acts of creativity and personal expression. It involves the ability to generate small, incremental creative ideas or solutions in the context of daily life. For instance, reorganizing one's desk in a novel way, experimenting with a new recipe, or devising a creative nickname for a friend exemplify mini-c creativity.
- Little-c: Little-c creativity involves more substantial creative accomplishments within a specific domain or field. It characterizes the creativity exhibited by individuals in their particular areas of interest or expertise. Typically, this level of creativity is demonstrated by novices or beginners in a given domain. An example of little-c creativity is a student crafting an original poem as part of a school assignment.
- Pro-C: Pro-C, or "professional creativity," represents the level of creativity displayed by professionals or experts within a specialized domain. These individuals have acquired advanced knowledge and skills within their field, enabling them to generate creative and original ideas or solutions. An instance of pro-c creativity would be a published author conceiving an innovative storyline for their next novel.

- Big-C: Big-C creativity, also known as "great-c" creativity, signifies the pinnacle of creativity. It involves substantial and groundbreaking contributions to a particular field or to society as a whole. This level of creativity is demonstrated by eminent individuals, including renowned inventors, artists, or scientists who have made transformative advancements. Prominent figures such as Leonardo da Vinci, Albert Einstein, or Steve Jobs exemplify big-C creativity through their enduring impacts on humanity.

Creative Thinking Architecture Students

This section aims to delve into the 4C Model of Creativity, with a specific focus on the concept called Creative Magnitude. The central message here is to encourage a more comprehensive perspective on creativity. It emphasizes that creativity isn't limited to groundbreaking, society-changing ideas; it encompasses a wide range of creative ideas, from small to large. Recognizing and harnessing everyday creativity is empowering because it allows individuals to apply their creativity in their immediate surroundings rather than waiting for a big, transformative idea. The breakdown of creativity into different categories helps individuals see that they use similar creative tools in their daily lives, enabling them to take better control over their personal lives and benefit themselves and those around them.

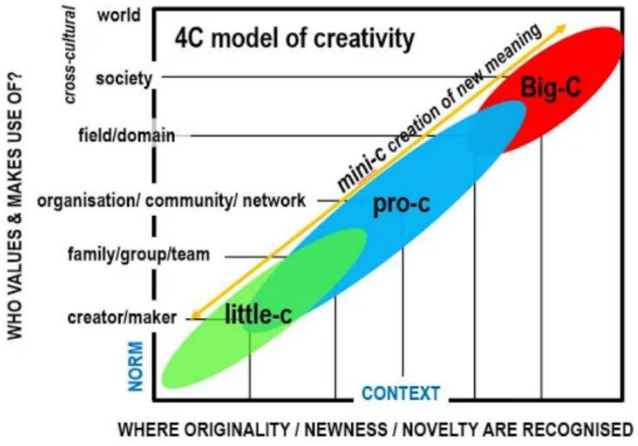

Figure 2. The relationship between the 4C hierarchy of the model of creativity and authenticity.
Source: Jared Volle, 2021

The 4C Model of Creativity consists of Mini-C, Small-C, Pro-C, and Big-C creativity:

- Mini-C Creativity: This is the most basic level, occurring within an individual's mind. It involves learning new things and making unique, useful connections. It is highly subjective and personal. Mini-C creativity serves as the foundation for all other types of creativity. It involves breakthrough moments, where individuals come up with unique interpretations and ideas. These moments are the starting point for problem-solving and further elaboration of ideas.
- Small-C Creativity: This level represents everyday creativity, where individuals find unique solutions to common problems in their daily lives. For example, creative problem-solving in daily challenges.
- Pro-C Creativity: This is a professional level of creativity recognized within a specific industry. Professionals in various fields, such as artists or consultants, exhibit this level of creativity.

- Big-C Creativity: This is the highest form of creativity, where ideas have a significant, industry-altering impact, like those of Albert Einstein or the creation of the first Google algorithm.

The author emphasizes that those aiming for Big-C creative ideas should prioritize holistic creativity, breaking industry norms with uniqueness rather than focusing solely on incremental improvements or competition. Creativity is a multifaceted concept that extends beyond monumental ideas. It encompasses personal, every day, professional, and industry-altering creativity. Mini-C creativity is at the core, providing the initial spark for all creative endeavours. Prioritizing uniqueness and combining it with effectiveness is a key strategy for achieving significant creative impact, especially at the Big-C level.

METODE

The table provided outlines the various types of creativity within the context of architecture education and their relevance to the learning process. This information will serve as a foundation for conducting research in the field of architectural education. The research methodology will involve the following steps: (i) Identifying Learning Outcomes: The first step will involve identifying specific learning outcomes related to each type of creativity (Mini-C, Small-C, Pro-C, and Big-C) in architecture education. This will require a comprehensive review of existing curriculum standards and educational objectives; (ii) Developing Assessment Criteria: Once the learning outcomes are established, the research will focus on developing clear and measurable assessment criteria for each type of creativity. These criteria will be used to evaluate students' performance in architectural education; (iii) Data Collection: Data collection will involve observing and assessing students' creative activities and problem-solving skills throughout their architectural coursework. This may include analysing design projects, class assignments, and student portfolios; (iv) Comparison and Analysis: The collected data will be systematically compared and analyzed to determine the extent to which each type of creativity is fostered within architectural education. Statistical analysis and qualitative assessment methods will be employed.

Table 1. Four C – Creativity in Architecture Study

Component	Definition	Example	Relevance to Architecture Learning
Mini-C Creativity	The most basic level of creativity, occurring within an individual's mind. It involves learning new things and making unique, useful connections. It is highly subjective and personal.	Finding innovative ways to arrange furniture in a room.	In architecture education, Mini-C creativity may manifest when students develop unique design concepts or spatial arrangements while learning and exploring new architectural principles.
Small-C Creativity	Everyday creativity where individuals find unique solutions to common problems in their daily lives.	Creative problem-solving in designing a functional yet aesthetically pleasing building facade.	Small-C creativity in architecture education equips students with problem-solving skills for addressing practical architectural challenges encountered in projects and assignments.

Component	Definition	Example	Relevance to Architecture Learning
Pro-C Creativity	A professional level of creativity recognized within a specific industry. Professionals in various fields exhibit this level of creativity.	An architect designing an environmentally sustainable building with cutting-edge technology.	In architecture education, Pro-C creativity involves students developing advanced design skills and techniques, preparing them for their future roles as professional architects.
Big-C Creativity	The highest form of creativity with ideas that have a significant, industry-altering impact.	Architectural innovators like Frank Gehry revolutionizing building design with iconic structures.	Big-C creativity in architecture education encourages students to think beyond conventions and envision groundbreaking architectural concepts that can shape the industry's future.

With this research methodology, we intend to gain insights into how different types of creativity are cultivated in architecture education and how pedagogical approaches can be optimized to better prepare students for their roles as future architects.

RESULT AND DISCUSSION

The interrelation among learning objectives, the 4C concept, students' learning styles, and design capacity is crucial in shaping a purposeful and customized learning process for architecture students.

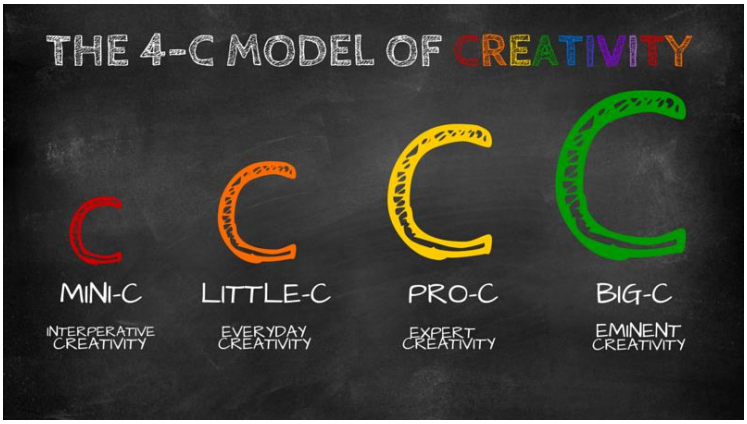

Figure 3. The 4C Model: framework for conceptualizing and classifying various levels of creative expression and points to potential paths of creative maturation
Source: Guard et al., 2015

Learning Objectives. In architecture education, learning objectives serve as the foundation by establishing precise aims and accomplishments that students are expected to attain during their educational pursuit. These objectives delineate the essential knowledge, proficiencies, and capabilities that students must cultivate to excel in the field of architecture. They function as a guiding framework, enabling educators to formulate well-suited instructional strategies and evaluation criteria.

4C Concept. The 4C concept, comprising Mini-C, Small-C, Pro-C, and Big-C creativity, enriches the learning experience by presenting a comprehensive perspective on creativity's diverse facets. It acknowledges that creativity exists in various forms, from everyday problem-solving (Small-C) to groundbreaking contributions (Big-C). This framework guides educators in recognizing and nurturing creativity at multiple levels, aligning it with specific learning objectives.

Students' Learning Styles. Understanding students' unique learning styles is pivotal in tailoring instruction to their individual needs. Architecture students possess diverse learning preferences, and educators must consider these variations when designing curricula and teaching methods. Whether students lean toward visual, auditory, kinesthetic, or other learning styles, aligning instructional strategies with their preferences can enhance comprehension and skill acquisition, directly impacting the attainment of learning objectives.

Design Capacity. Design capacity encompasses the ability to conceive, develop, and communicate architectural designs effectively. It embodies the practical application of knowledge and creative thinking. Integrating design capacity within learning objectives necessitates a focus on hands-on experiences, design projects, and studio work. By honing students' design capacity, educators equip them with the essential skills to meet their educational goals and contribute meaningfully to the architectural profession.

In essence, the synergy between learning objectives, the 4C concept, students' learning styles, and design capacity creates a well-rounded educational framework that empowers architecture students to achieve their intended learning outcomes while nurturing their creative potential and accommodating their unique learning preferences.

Creativity Development Architecture Education

In the field of architecture and urban design, there are significant challenges when it comes to practicing sustainable design (Salmanian & Ujang, 2021). These challenges include balancing aesthetic appeal with energy-efficiency, integrating green technologies into existing infrastructure, and educating clients and stakeholders on the importance of sustainable design principles (Shen et al., 2008). Additionally, there may be financial constraints and limitations in the availability of sustainable materials and technologies. Barriers to and Opportunities for Promoting Sustainability in Higher Education When it comes to promoting sustainability in higher education, there are both barriers and opportunities (Tonietto et al., 2021). Barriers include a lack of awareness and understanding of sustainability concepts among faculty and students, limited resources for incorporating sustainability into curriculum and research, and Opportunities, on the other hand, include the potential for interdisciplinary collaborations and partnerships with industry and community organizations, the availability of funding and grants forsustainability initiatives, and the growing demand for graduates with sustainability knowledge and skills (Terlević et al., 2015). A map for implementing sustainability education in architecture and urban design has been proposed, which includes strategies such as integrating sustainability into the curriculum, providing faculty training and resources, fostering interdisciplinary collaborations, and engaging with industry professionals and community stakeholders (Bozkurt, 2016).

Understanding Creativity in Architecture Education

Creative architectural education is not just about imparting knowledge, but also about fostering a learning environment that supports and enhances creative behavior . This involves emphasizing the psychological aspects of creativity and allowing for flexibility and innovation in learning. By focusing on the way students learn and encouraging creative behavior, architectural education can provide a more comprehensive and effective learning experience. To address the challenge of integrating sustainability into architectural education, there has been a growing emphasis on raising awareness among students and faculty about the importance of sustainable design principles and the potential benefits they can bring to design projects (Lukito & Miranda, 2018). By integrating sustainability into the curriculum and design studios, students can develop a deep understanding of sustainable practices and approaches. This understanding can then be applied to their future architectural projects, allowing them to create environmentally conscious and sustainable designs. In order to achieve this integration, it is important to incorporate new technologies and software that are relevant to the field of architecture (Castilla, 2018). Additionally, incorporating new architectural presentation trends, which are commonly used in professional practice, into the design of performance tasks can help students acquire updated knowledge and skills that are applicable in real-world architectural practice (Eltanal & Avelino, 2020).

Creativity plays a crucial role in architecture education, as it is an essential aspect of architectural design (E. J. Park & Kim, 2021). The design studio classes are at the core of architecture education, providing a shared creative environment for students to test ideas and propose design projects (Komarzyńska-Świeściak et al., 2021). To enhance creativity in architectural design education, various methods and tools have been explored. For example, interactive media can stimulate the senses and enhance designers' creativity (Liu et al., 2021). Immersive virtual reality applications, such as CREALITY 1.0, have been used to teach architectural composition and foster student creativity (Espinosa & Oton Alberto Navas de la Cruz, 2023). Additionally, mental simulation training has been found to improve the academic performance and creativity of architecture students (Sadeghi et al., 2020).

In order to nurture students' creative thinking in design education, visual communication and the translation of filmic spaces into spatial design have been emphasized (E. J. Park & Kim, 2021). Basic design courses in interior architecture education aim to develop students' creative thinking skills and bring back a sense of childish creativity (Aşkın, 2018). Teaching critical thinking within architectural design education supports the development of design thinking and individual creative design processes (Schoch & Lawanyawatna, 2018). The physical environment and teaching methods also play a role in fostering creativity in architecture education. Restorative environments have been found to have a positive effect on creativity in the context of architecture education (Sabir, 2020). Creative design studios provide an environment where vulnerability can be converted into creative intensity (Marques et al., 2021). The medium of 'curiosità' in design education promotes curiosity and a non-ending appetite for knowledge, which are essential for creativity (Yurtkuran & Taneli, 2013).

It is important to note that creativity is not only about revealing new products but also about synthesizing known information and discovering different solutions (Erdem & Adiguzel, 2019). Therefore, education for sustainability has been explored in architecture and urban design education, aiming to integrate sustainability into the curriculum and promote creative

approaches to address environmental challenges (Altomonte et al., 2012). In conclusion, creativity is a fundamental aspect of architecture education. Various methods, tools, and environments have been explored to enhance creativity in design education. These include the use of interactive media, immersive virtual reality applications, mental simulation training, visual communication, and the creation of restorative environments. Additionally, fostering curiosity, critical thinking, and a sense of vulnerability can contribute to the development of students' creative thinking skills in architecture education.

Exploring Creativity Development in Architecture Education

To address the challenge of integrating sustainability into architectural education, there are several proposed strategies. These strategies include: incorporating sustainability principles into the curriculum, providing hands-on experiences and practical projects that focus on sustainable design, inviting industry professionals to share their expertise and experience in sustainable architecture, and fostering a collaborative and innovative learning environment (Calikusu et al., 2023). These strategies aim to not only raise awareness about sustainability, but also provide students with the necessary knowledge and skills to incorporate sustainable principles into their designs. Creativity development plays a crucial role in architecture education as it fosters innovative thinking, encourages unconventional problem-solving approaches, and allows students to explore unique design ideas. By promoting creativity in architecture education, students are encouraged to think outside the box and push boundaries in their designs.

Creativity development also helps students develop their own design identity and style, enabling them to create distinctive and impactful architectural solutions. Creativity development in architecture education is essential for nurturing innovative thinking, fostering unconventional problem-solving approaches, and enabling students to explore unique design ideas (Da Cruz Alves et al., 2021). Creativity is a critical skill for architects, as it allows them to think innovatively and find unconventional solutions to design challenges. Integrating creativity development into architecture education can enhance students' design abilities and prepare them for the dynamic and ever-evolving nature of the architectural profession. Creativity development in architecture education is crucial as it allows students to explore innovative design ideas, think critically, and solve complex architectural challenges (Jadresin Milic et al., 2022). By integrating sustainability principles into the curriculum and fostering a creative learning environment, architectural education can equip students with the knowledge and skills to address real-world challenges in a sustainable and innovative manner.

Some methods for cultivating creativity in architecture education include incorporating experiential learning and practical projects focused on sustainable design, inviting industry professionals to share their expertise and insights, encouraging collaboration and interdisciplinary work, providing opportunities for hands-on experimentation and exploration, promoting a culture of open-mindedness and risk-taking, and providing opportunities for self-reflection and self-expression (Angeline, 2014). These methods can help students develop their creative thinking skills, expand their design capabilities, and prepare them for the demands of the architectural profession. By nurturing creative thinking in design education, students can develop a deep understanding of ill-defined design problems and generate various design ideas through critical design thinking (E. J. Park & Kim, 2021). Additionally, incorporating design thinking methodologies and integrating technology and digital tools into the curriculum can also

enhance creativity development in architecture education. Overall, creativity development in architecture education is of utmost importance as it enables students to think outside the box, approach design challenges from new perspectives, and contribute to the advancement and innovation of the architectural field. Moreover, creativity development in architecture education fosters a sense of passion and inspiration within students, motivating them to push boundaries and create architectural solutions that are not only functional but also aesthetically pleasing and sustainable (Architectural Education, 2018).

CONCLUSION

In conclusion, this paper highlights the paramount significance of nurturing creative thinking in the realm of architectural design and underscores its profound implications for the future of the discipline. The adoption of the Four C model offers a holistic and nuanced approach to comprehending and cultivating creativity within architecture education. By integrating problem-based learning (PBL) with the innovative tool of mind mapping, educators are equipped with potent instruments to enhance the creative aptitude of architecture students. This approach not only fosters collaboration and critical thinking but also stimulates visual and associative thinking, thus nurturing a fertile ground for the generation and organization of innovative architectural ideas.

Furthermore, the role of technology in architecture education emerges as a transformative force, fostering mixed learning environments that encourage collaborative and creative thinking. Embracing technology readiness empowers students with the digital tools necessary to confront real-world challenges and conceive imaginative and visionary architectural solutions. In essence, this research emphasizes that creativity is not merely a desirable trait but an indispensable asset in architectural design. Through the adoption of the Four C model, the implementation of PBL with mind mapping, and the strategic utilization of technology, educators possess the means to revolutionize architecture education. In doing so, they pave the way for a new generation of architects who are not only academically proficient but also creatively adept, fully prepared to shape and influence the ever-evolving world with their innovative and visionary designs.

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