



# Creativity and Innovative Learning

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**How to cite this paper:** Onyango, O.M. and Xiong, M. (2025) Creativity and Innovative Learning. *Open Access Library Journal*, 12: e11002.

<https://doi.org/10.4236/oalib.1111002>

**Received:** November 16, 2024

**Accepted:** January 21, 2025

**Published:** January 24, 2025

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## Abstract

Giving learners the tools and skills they need to navigate the constantly shifting and unpredictable world they live in is essential in the context of modern education. In educational contexts, creativity is becoming recognized as a critical attribute that is encouraged in curricula as well as classroom instruction. Teachers are becoming more aware of how crucial it is to include contemporary technologies in their lesson plans to foster students' creative growth. The objective of this study is to evaluate and comprehend the effects of technological advancements, evolving workplaces, political situations, and unstable economic conditions on the promotion of creativity in educational settings by a thorough analysis of previous studies. It is essential to recognize that these studies have limitations, however. A few of the main issues that surface is an unclear implementation strategy, a need for more knowledge about the study design, and an inadequate measuring technique.

## Subject Areas

Creativity, Innovative Learning, Education

## Keywords

Creativity, Innovation, Political Conditions, Economic Conditions, Teachers' Creativity and Learners' Creativity

## 1. Background to the Study

Because disruptive technologies are widely used, workplaces are evolving, political environments are changing, and the economy is unpredictable, modern schools must encourage students' flexibility. Information and knowledge workers have been aware of the notion in question for more than 20 years (Li *et al.*, 2022) [1]. As a result, it is now a well-known fact. Adaptability is the ability to continuously accept learning through the study of creative work practices, the development of creativity, and the preservation of relevance in a constantly changing setting. Errors

have intrinsic value and are an essential part of learning, according to organizations that understand the importance of continual learning.

Consequently, they make a concerted effort to foster a culture that embraces and even celebrates mistakes rather than placing blame. It is impossible to overestimate the importance of creativity as a fundamental skill for students in the twenty-first century. Scholars and experts have examined various methodologies to offer distinctive educational opportunities beyond the conventional classroom context.

The advent of new technologies has resulted in changes in the learning environment in recent years (Li *et al.*, 2022) [1]. In classrooms with lots of technology, teachers can use digital resources and technology to foster and promote students' creative thinking. The utilization of digital technologies to support creative problem-solving, facilitate ideation sessions, and aid in creating innovative art design serves as an illustration for this claim. Scholars' interest in the effects of evolving technology on creative creation has been sparked by the growing convergence of these two fields.

Originality and usefulness are emphasized as two essential qualities of creativity in many definitions. When confronted with a challenging assignment, the capacity for creative thought enables people to embrace alternative viewpoints or generate fresh concepts. Generating original ideas and practical solutions to problems is the essence of creativity (Li *et al.*, 2022) [1]. A psychometric tool called Torrance's Tests of Creative Thinking (TTCT) is frequently used to assess creativity. Fluency, flexibility, elaboration, and originality are the four fundamental components of creativity, according to the TTCT. Fluency is defined as the speed with which pertinent responses are produced. The number of unique sets of pertinent answers measures flexibility. The responses' elaboration evaluates the depth and caliber of the answers. Lastly, originality gauges the degree of variation in the produced answers.

The existing literature needs to provide a widely accepted description of emerging technologies in education. However, it recognizes three separate efforts to define these technologies. Emerging technologies are those that, in the next one to five years, significantly alter educational approaches and outcomes, according to a study conducted by the New Media Consortium (NMC). The NMC links emerging technologies to social software platforms like Facebook, blogs, and Wikis, emphasizing the potential advantages these tools may have for education. In order to accomplish a range of educational objectives, it is essential to use technologies as instructional tools in various educational settings (Li *et al.*, 2022) [1].

Depending on the study's perspective, the meanings of technologies can change. On the other hand, scholars generally concur that different contextual factors impact technology. These variables consist of resource availability, geographic variations, and institutional levels. In some regions of the world, certain technologies are well-established, while in others, they are still in their infancy. For instance, although e-learning is growing in popularity in wealthy nations, it is still a relatively new technology in places with inadequate Internet connection and com-

munication infrastructure. It is also important to emphasize that new technologies are usually only partially original. Specific technologies used for commercial purposes are nevertheless regarded as being in their early stages of development in education, as the Twitter case study illustrates.

Future scholarly investigations in creativity studies and technology application will be significantly impacted by additional research on the relationship between new technologies and creativity, given the growing use of these tools to support creative endeavors. The main goal of recent literature reviews has been to investigate the fundamental ideas that govern creativity in the technology setting. These studies also aim to assess how educational policies affect the use of technology in order to promote innovation across national boundaries. Moreover, they underscore the noteworthy influence that technology wields in fostering inventiveness within the sphere of education in the 21st century.

Every one of the previously stated subjects is a crucial field for academic research. Teachers need to be well-versed in the integration of these emerging technologies in order to fully reap the benefits of their potential to foster creativity (Li *et al.*, 2022) [1]. By assessing the best ways to use cutting-edge technologies in classroom environments to foster creativity, this review adds to the body of knowledge. It also points out gaps and restrictions in current knowledge, opening the door for new studies into the intersection between innovation and technology.

In educational contexts, individual creativity and mindfulness have both been encouraged. However, in order to fully understand the connection between mindfulness and creativity and the implications of this connection in educational settings, previous research must be synthesized. A theoretical framework suggested by Henriksen *et al.* (2020) [2] suggests a strong connection between the entities previously mentioned. These ideas cover a broad spectrum and are closely related to each other in terms of feelings, concentration, anxiety, psychological state, self-awareness, and environmental awareness. Understanding the body of research on the link between these two domains is essential, given their significance in cognitive processes and educational settings.

Student involvement in group or classroom learning may help students contextualize their interactions within more extensive social networks, as noted by Fan (2019) [3]. Because of this, the connections made by students on these social networks may enhance the quality of the information shared. In academic settings, students form informal bonds of friendship and acquaintance with their teachers and fellow students, referred to as “network relationships”. It has been demonstrated that these connections affect kids’ academic achievement and classroom activities. The present understanding of how personal connections affect students’ creativity has received much attention, especially regarding the sharing of diverse knowledge. However, a complete understanding of the degree to which network connections could promote disseminating the effects of a creative learning environment on student creativity still needs to be discovered.

Students’ goals, ideas, resourcefulness, and capacity to take on entrepreneurial

roles are all encouraged to grow through entrepreneurship education. Through practical instruction, motivation, and active participation in the learning process, entrepreneurship education equips individuals with the skills they need to pursue their entrepreneurial goals (Machali *et al.*, 2021) [4]. Moreover, scholars contend that education should foster a range of factors that impact these goals, including the development of entrepreneurial skills, aspiration formulation, and knowledge gain. Integrating successful entrepreneur observations into entrepreneurship education can impact students' cognitive traits, such as self-efficacy. Students might then be in a better position to decide on their objectives and follow actions with greater knowledge.

### Research Questions

- How has creativity been fostered in academic contexts by technological advancements, unstable political environments, changing economic realities, and evolving work environments?
- To what degree have advancements in technology, evolving workplace environments, political changes, and unstable economies contributed to the growth of students' inventive and creative abilities?
- What quantifiable consequences do dynamic work environments, shifting political landscapes, unpredictable economic conditions, and technological integration have on students' creativity during the learning process?
- Which research designs and evaluation instruments are employed in this study to gauge innovation and creativity?

## 2. Literature Review

### 2.1. Instructors'/Environmental Creativity

Through the course of the fourth industrial revolution, education must prioritize the development of critical and creative thinking skills. The ability of critical thinking to help students create strong arguments, evaluate the reliability of sources, and assist in making wise decisions is the primary justification for its significance. It is also believed that encouraging kids' creativity in a positive learning environment is a better way to support their non-academic aptitudes and talents. To effectively support learning and make educational resources a visible presence in the classroom, teachers need to be creative and original. Gu (2017) [5] and Selkrig (2017) [6] claim that creative teachers employ various techniques to get over obstacles in the classroom and help students reach their learning objectives.

Numerous empirical research studies have yielded results that corroborate the positive association between teachers' creativity and originality and meeting high academic standards in the classroom. Rasmi (2012) [7] asserts that the teacher's degree of originality has the most significant influence on how effective the learning process is in the classroom. Empirical data was provided by Ayob *et al.* (2013) [8] and Pishghadam *et al.* (2012) [9] to bolster the notion that teacher creativity plays a significant role in fostering a positive learning environment and improving

students' problem-solving abilities. In order to increase educational effectiveness, educators must continuously foster their creativity by taking part in professional development activities, carrying out ongoing scholarly research, doing thorough reviews of pertinent studies, and having ongoing conversations with colleagues (Arifani & Suryanti, 2019; Liu *et al.*, 2020) [10] [11].

This inquiry focuses on the characteristics and expressions of a teacher's creativity. According to Rasmi (2012) [7], three different components make up teacher creativity in an academic setting: creative learning, education that fosters creativity, and creative instruction. The effectiveness of teachers' instructional strategies in the classroom is influenced by how these three components interact. Using various tools, tactics, resources, and approaches in the teaching process sets creative educators apart. These tactics include helping students use instructional tools effectively, encouraging meaningful learning experiences, offering examples to help students understand concepts better, and incorporating natural resources or real-world applications to help students grasp concepts more deeply (Ayob *et al.*, 2013) [8]. Creative learning is an instructional technique that supports the development of student's cognitive abilities and behavioral tendencies by encouraging creative thinking.

It is impossible to overstate the value of teacher creativity in the context of entrepreneurial education since it fosters students' creative potential, which in turn affects their inclination toward and engagement in entrepreneurial endeavors. Mason and Arshed (2013) [12] found that integrating entrepreneurship education into curricula at educational institutions gives students the knowledge and abilities they need to pursue entrepreneurial endeavors. This teaching approach encourages the growth of an entrepreneurial mindset, which is advantageous for identifying and seizing opportunities, as well as the inventiveness and skills necessary for the founding and growth of businesses in the future. In order to guarantee the achievement of the designated objectives, educators must demonstrate increased innovation in creating entrepreneurial education programs (Adedeji & Rahman, 2018) [13]. Consequently, the field of entrepreneurship education is impacted by the innovation of instructors.

### **Student's Creativity**

Students need to be able to think creatively since economic challenges are becoming more complicated, especially in the context of the fourth industrial era (Arbia *et al.*, 2020; Astuti *et al.*, 2020) [14] [15]. Within modern life and work, it is widely acknowledged that genuineness, adaptability, and flexibility are necessary for people to navigate the obstacles arising from their constantly evolving circumstances effectively (Jooss *et al.*, 2020) [16]. Huang *et al.* (2020) [17] claim that creativity is multifaceted and consists of various elements, such as cognitive, emotional, and psychomotor components. According to Sudjarwo *et al.* (2019) [18], creativity is characterized as a cognitive process or way of thinking that materializes original discoveries and creations in a significant and imaginative way.

Creativity and innovation are two different concepts. According to Perry-Smith

and Mannucci (2017) [19], creativity is defined as a particular method of idea generation. In contrast, innovation is the complete process of converting ideas into actual results through implementation and execution. Creativity and innovation are essential for business development. Originality and usability are the cornerstones of entrepreneurial innovation. Students' entrepreneurial aspirations and creativity levels are related; in particular, students more driven to become entrepreneurs are likely to be more creative (Runco & Pritzker, 2020) [20].

### 3. Research Methodologies

#### Search Strategy and Selection Criteria

The aim of this review was to examine the use of new technologies in educational settings. The chosen academic works were gathered from reputable education databases, including Academic Search Ultimate (ASU), Education Source, PsycINFO, and ERIC. Using guided-style search windows, complex searches were carried out after conferring with a university librarian. The "DE" field is used in a sophisticated search in EBSCO databases, including ERIC, to find the subject headings and keywords of the writers. English articles and dissertations met the inclusion criteria for this study; publications deemed irrelevant were eliminated through abstract evaluations. Furthermore, all digital tools, technologies, and apps utilized in educational contexts were the main objectives of the first cluster. (See **Table 1**).

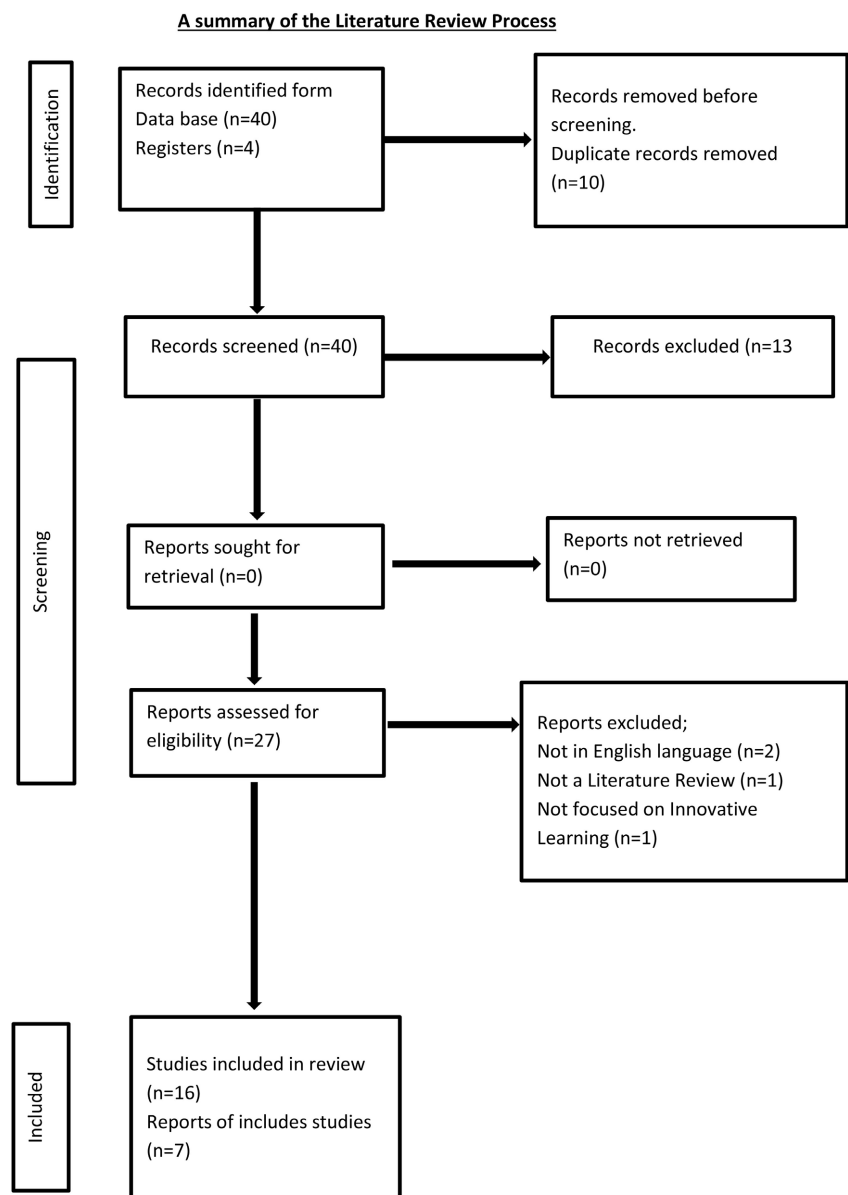
**Table 1.** Inclusion and exclusion criteria.

Inclusion	Exclusion
Journal Article	Conference proceeding, book series, chapter in book,
Literature Review	books, and dissertations.
Focus only on Innovative and	Not a Literature Review
Creative Learning	Articles that centers primarily on other types of learning
Available as full text	Not available in full text
Article written in English	Article in other language than English

In addition, abstracts (AB) and titles (TI) containing the terms "technology" or "digital" were included in the search. The research used a variety of terminology terms, including "Educational Technology", "Technology", "Computer Uses in Education", "Information Technology", "Computer Oriented Programs", "Computers", "Technology Integration" and "Technology Uses in Education". The second cluster showed the terms that were employed in the study. In addition to the wildcard operator (\*) to accommodate various variations of the word "creative" in abstracts (AB) and titles (TI), the study included particular terms like "Creativity", "Creative Thinking" and "Creative Development" in the study. The third cluster's main objective was to locate and gather all articles about empirical studies on the subject. A comprehensive understanding of the causal relationship between technology integration and creativity was the aim of the selection process for systematic review studies. (See **Table 2**)

**Table 2.** Content and discourse analysis.

Articles	Content	Discourse
Number of literature & time series of literature	Finding the main themes and ideas in each source's discourse and material was the first stage. To do this, essential words or phrases, patterns, and recurring themes were searched as it is simple to comprehend the data and its relationship to the sources by concentrating on each component.	Carried out a discourse analysis of each source, observing how language is employed to convey specific concepts, viewpoints, or messages on creativity and innovation. This was accomplished by looking at the terms used, the manner the language is written, and the context in which it is used. The second stage involved analyzing the words and phrases used in each source, searching for trends in the text, and figuring out the main ideas or messages that were being sent.



**Figure 1.** A summary of the literature review process.

This research yielded a total of 40 articles. After removing duplicated papers, 30 papers remained. 13 papers were then excluded based on the screening titles and abstracts. The remaining 27 papers were considered and assessed as full texts. Four of these papers did not pass the inclusion criteria. Thus, as a total number, 23 eligible research studies remained for inclusion in the systematic review. **Figure 1** presents the study selection process as recommended by the PRISMA flow chart.

#### 4. Findings and Discussions

By developing and validating a mediation model, this research aims to explore how a creative learning environment affects students' creativity. The current approach examines the relationship between student creativity and a creative learning environment by examining various intervening elements. The information indicates a positive correlation between student creativity and a creative learning environment. Enhancing students' orientation toward learning goals, information exchange, and network connections act as a mediating factor in this relationship.

Scholarly papers from the past ten years that are concerned with the development of tools that promote creativity are included in the current systematic review. This research offers empirical support for the idea that emergent technologies display context-specific traits after a comprehensive and methodical analysis. Consider the technology's educational potential for fostering the development of creativity while selecting which one to employ. This study investigates the instructor's perception of the contribution that particular technological elements make to fostering creativity in a particular field of study. Wiki spaces, social media platforms, and online courses are examples of web-based platforms that boost student interaction and facilitate idea sharing. Actively including students in the learning process broadens their perspectives and creates an atmosphere favorable to the growth of creativity.

The abundance of online resources positively impacts students' capacity to generate original ideas in web-based learning environments. Additionally, students can get a broader range of viewpoints on a particular subject matter by using digital platforms for knowledge-sharing activities, which improves their capacity to complete ideation assignments effectively. Technology has a more substantial noticeable impact on creative elements, precisely flexibility and fluency, when students have access to online resources and social engagement opportunities. Bidirectional communication is available in an interactive learning environment, enabling students to communicate online with the system, instructors, and other students.

Wearable technology, movies, and simulations create an environment that fosters creativity. Interactive learning environments, like video games and simulations, include many learners and react to their inputs and activities consistently. Students get new ideas and strengthen their skills by effectively overcoming challenging problems in these settings. The dynamic atmosphere gives students a great

deal of flexibility when it comes to problem-solving, enabling them to overcome challenges by considering a wide range of options. Consequently, significant effects in terms of creative components like fluency and flexibility can be shown. Essentially, it might be argued that students strengthen their flexibility—the ability to accept different points of view—as well as their fluency—the ability to produce a range of ideas.

This study's main objective was to examine several mediating processes to assess how a creative learning environment affects students' creativity in the classroom. This discovery will add to the current body of knowledge in several ways. This study examines the potential impact of a creative learning environment on people's creativity to fill a vacuum in literature. More empirical data is needed to support the benefits of creativity, despite past research suggesting that promoting creative activities in the classroom can enhance students' academic performance (Richardson & Mishra, 2018) [21]. Thus, in response to the academic community's call for solid proof of the benefits of creative learning environments (Davies *et al.*, 2013) [22], the current study creates a theoretical framework to look into how these contexts foster undergraduates' creative potential.

Additionally, this study is an early attempt to examine diverse systems from an alternative viewpoint to comprehend how students' creativity is fostered in a creative learning environment. In this regard, the current study emphasizes the unique mediators—knowledge sharing, network linkages, and learning goal orientation—building upon the dynamic componential model. The body of research showing that identifying numerous processes can lead to a comprehensive knowledge of the usefulness of contextual factors about creativity has expanded in recent scholarly debates (Amabile & Pratt, 2016) [23]. However, little research has been done on mediators that concurrently foster or specifically target undergraduate students' creativity. By showing how a creative educational environment can enhance students' learning goal orientation, network linkages, and knowledge exchange, promoting even more student creativity, this research advances our understanding of the mechanisms involved in nurturing student creativity.

### **Educational Implications**

According to the research findings, to maximize students' creativity in the classroom, creative features must be incorporated into the design of the educational environment. In the field of education, teachers have the power to establish an atmosphere that stimulates students' conceptual growth and acquisition of knowledge. This objective can be accomplished through several tactics, such as establishing a setting that promotes intellectual curiosity and risk-taking in students, enabling free-flowing and transparent communication, offering support for new ideas, and giving students more freedom and flexibility when completing assignments. Educators also need to understand how crucial it is for students to be focused on their learning objectives, for networks to be connected, and for knowledge to be shared in order to facilitate the spread of the benefits that come from

an innovative learning environment (Lerang *et al.*, 2019) [24]. Instructors ought to stress the value of students' work and their conceptual understanding of the material more than just course grades.

By using this technique, teachers can help students build their learning objectives toward producing creative achievements. In terms of the growth of students' professional networks, educational initiatives that seek to enhance their ability to manage social connections—both personal and peer—can be implemented. In the classroom, this approach promotes effective learning and teamwork skills. Finally, teachers can consistently stress the value of information sharing and exchange, giving students more access to original content that can improve their educational experiences and boost their efficacy in fresh ways. More research is required to thoroughly document the intricate process involved in the implementation of technology integration. Moreover, these inquiries must have comprehensive details regarding the research and evaluation approaches employed.

It is also essential to remember that the research examined the use of technology to foster creativity during very short periods—between one month and a semester. To fully comprehend the variables influencing technological advancement, including shifting workplaces, shifting political environments, and unstable economic situations, more long-term research is needed. These studies are essential for long-term creativity promotion in school settings.

When a teacher provides various options for learning activities beyond the traditional classroom setting, students are likely to become more creative. This phenomenon occurs when a teacher goes through personal growth and develops into a dynamic and inventive person. Students will be inspired to develop their own creativity by the creative works produced by their teachers.

Additionally, vocational schools need to actively support and encourage the innovative ideas of their instructors by offering an atmosphere that is innovative, appropriate resources for support, and enough funding. By executing strategic policies and providing various training opportunities, the school principal and stakeholders support the development of teacher creativity. Future studies must thus take into account other factors that are pertinent to entrepreneurial objectives, such as entrepreneurial orientation, knowledge of entrepreneurship, entrepreneurial attitude, and entrepreneurial preparation.

## 5. Conclusion and Recommendations

In order to promote creativity in educational settings, the main objective of this research was to examine and comprehend the rise of technologies, changing work environments, shifting political landscapes, and unanticipated economic realities. The introduction of novel educational strategies fosters this creativity. The present study concluded that teachers are crucial in fostering students' creative growth and supporting the adoption of innovative teaching strategies. The study also provided evidence in favor of the moderating effect of inventive and creative education in enhancing the relationship between the variables being examined. Regarding

the application of a creative and innovative teaching strategy in schools, this study has several implications for educators as well as students.

In addition to the government incentives, educators think students' creativity needs to be developed. Being a source of inspiration, encouragement, and support for students is the aim of creativity skills development, as it fosters their capacity for creative thought. These abilities are essential in the modern world. Developing creativity also plays a significant role in helping students make strategic decisions about their careers. Moreover, educators need to focus on affective and psychomotor domains in addition to cognitive components.

The educational model or curriculum must be continuously revised in conjunction with the instructors in order to enhance students' self-assurance and provide them with the skills they need to make a smooth transition from formal schooling to post-secondary endeavors. Institutions of higher learning and essential stakeholders should work with the business community to enhance their comprehension of entrepreneurship.

### **5.1. Recommendations for Research**

### **5.2. Limitations**

Despite the fact that this analysis has offered some data that contradicts the research questions, given the focus that governments, educational institutions, and scholars worldwide have placed on creative learning environments over the past ten years, we are surprised by the overall dearth of empirical research in this area. In what is frequently perceived as the somewhat "soft" and ill-defined field of creativity and education, the comparatively small number of papers considered in the actual review is indicative of the absence of an empirical data foundation. Since a large portion of the literature in this field is philosophical, anecdotal, or polemical, there are substantial evidence gaps concerning the usefulness of the research questions that form the basis of this review, despite widespread conviction to the contrary. Literature, for instance, says remarkably little about how cross-curricular learning approaches help students develop their creative abilities or how they affect students from various socioeconomic, racial, or cultural backgrounds. In light of these, the following suggestions must be taken into account:

- Thanks to this relationship, students would have many opportunities to gain practical experience and a comprehensive understanding of the fundamentals of entrepreneurship. Students who spend more time practicing entrepreneurship will be better prepared to enter the workforce after completing their academic studies. It is challenging to summarize the complex relationship between creativity and innovation because of its complexities. Though complex, the relationship between creativity and mindfulness is usually positive.
- There is much evidence to support the beneficial effects of mindfulness on creativity. However, depending on the situation, the nature of this interaction may alter and have more complex effects. The current study looked into the relationship between mind-wandering, mindfulness, and creativity, as well as the

possibility of mindfulness to encourage purposeful mind-wandering (rather than spontaneous mind-wandering) to boost creativity in educational settings.

- Empirical data reveals that research in this sector has potential. However, further investigation is required to cultivate a more nuanced understanding of the link. Meta-analysis has offered empirical evidence to infer a causal association, demonstrating that mindfulness training has a supportive, reinforcing, and expanded influence on creative thinking in addition to establishing a correlation. In many ways, mindfulness and creativity must be better understood because they involve such intricate and diverse realms.
- Educators must have access to a larger body of research on integrating mindfulness and creativity in realistic learning settings. This would allow for a more comprehensive knowledge of the intersection of these concepts in their natural environment, boosting understanding of mindfulness and creativity outside of restricted laboratory or testing settings. Integrating correlational and causal links between creativity and mindfulness has important implications for learning psychology, notably in creativity and creative education. These consequences are related to the growth of creative abilities and the building of self-concept.
- In practice, it may be beneficial to aid educators in appreciating the possible benefits of various mindfulness practices about the diverse needs and duties of their pupils. This idea may hold in cognition, education, and human development. Previous scholarly studies reveal a potentially successful convergence; nonetheless, there is a need for more implementation of action research approaches inside educational settings, which could improve our empirical and practical understanding. Understanding mindfulness and creativity in their respective contexts is critical, as they are essential in promoting well-being and supporting personal and societal growth. Nothing less is required for the trajectory of human cognition, well-being, and growth.

### Conflicts of Interest

The authors declare no conflicts of interest.

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