A Qualitative Study on Teaching Methodologies in Design Education

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Abstract

The study of teaching methodologies in design education is an important area of research as it can help to improve the quality of design education and promote better learning outcomes for students. This research aims to measure creativity and discover teaching strategies to develop creativity among visual art field students. This study involves an exploration of various approaches and strategies employed to impart knowledge and foster creative skills in the field of design. Design education faces several challenges, including balancing technical skills with creativity and critical thinking, which could be solved by improving teaching and learning relationships by focusing on teaching methodology to meet students' needs. The research delves into traditional and contemporary teaching methods, examining their effectiveness in addressing the dynamic and evolving nature of design disciplines. The objective of this study is to investigate the teaching methods employed in design education. The study focuses on teaching methodology and strategies to enhance creativity and critical thinking. In this study, we utilize a qualitative research design that incorporates document analysis and thematic analysis. The data is collected through document analysis and literature review. The findings will provide valuable insight and strategies to advance their creativity and independent thinking.

Keywords: *Teaching Methodologies, Design Education, Learning Outcomes, Creativity, Critical Thinking, Student Engagement.*

INTRODUCTION

The 21st century is the most globalized and dynamic era that requires students to be highly interactive and active to live and work in an instantly altering society of the technological and digital world. Art education assists students in modifying their perceptive senses towards the visual world and responds to them effectively with increased consciousness and refined judgment. Art reflects the metaphysical dimension, and its curricula should be conceptually based, successively

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evolved, and focused on creativity and critical awareness to enable students to become self-confident, independent, self-determining, and contributing members of society. It has been observed by most art educators that the discipline has reached a dilemma in its development and how to stimulate creativity.

Education is the constructivist treatment of the soul. Perceptions of reality are shaped by social constructs. Constructivism has a particular depth in its association with those working within the art that includes interaction, which constitutes a paradigm in which most art educators operate. Art is an overlapping term. Art can be defined as an expression of creativity. Creativity has no boundaries. Art has always been debated and has always been the victim of controversy. A global and cross-cultural perspective is necessary to understand art and the importance of art and design education.

The instructor focuses on daily objects that connect reason, function, and aesthetics. Design students master elements and principles of composition, with an emphasis on creating something useful that fulfills a need or a particular function. Every innovative design has a unique solution in its form and function that creatively resolves a problem. Design consists of two elements: creativity and analytical reasoning with rational thinking. Design leads to a result that is unexpected and valuable.

Design is a complex field. Designer education, similar to other educational domains, revolves around the acquisition of skills, nurturing talents, grasping the fundamental concepts and theories within the discipline, and the absorption of a guiding philosophy. Regrettably, a considerable number of design schools operate based on misguided foundations. Often, the skills we impart are closely tied to outdated practices and methodologies of a bygone era. This era requires productive and inventive designs for the real world to drive social change in human ecology. Today, the world faces new challenges, and designers are playing a larger role in solving that crisis, not only by designing but also by managing beyond the design studio.

Design education should aim at creating reflective practitioners. Thus, design is not problem solving but 'a reflective conversation with the materials of the situation. Creativity and rationality are two elements of the paradigm of design education. In design education, the guidance varies from person to person, which can be found in the different methods, as educators have different original bases, different learning conditions, and different personalities. In terms of teaching methods, it is necessary to be flexible and diverse, teaching students according to their aptitude.

In the current skill and drill educational environment, there is little room for art or creative thinking. Design education combines creativity, rational thinking, and practical problem solving - exactly the sorts of skills that are needed in the global economy. Art and design education is a multidimensional field with a vast and broad scope. Integrating design education into the curriculum of visual art educators can serve as a means to demonstrate the relevance of the visual arts in the contemporary world. This combined approach to art and design education not only contributes to personal growth but also has the potential to bolster the economy.

There are various growing challenges faced by design education. Implementation of design education is very low, and art and design have progressed so slowly. The curriculum has developed very slowly. Although in design education, effective teaching practice is very rare due to a lack of instruction, understanding, teaching principles, and design practice, teaching methodology has to

focus on the design process. It requires divergent thinking and flexibility. The research objectives of the current study are:

- To investigate pedagogical practices found in design education.
- To explore teaching methodologies and strategies used in design education to enhance creativity and critical awareness.

Research Questions

- What pedagogical practices are found in art and design education?
- What are effective teaching methodologies and strategies to develop creativity among art field students?

REVIEW OF RELATED LITERATURE

Art is an overlapping term. It is an expression of creativity. But when aesthetics and reasons are blended with creativity, it creates applied design. We are surrounded by several designs that accommodate our lives in a proper and concrete shape. Designers fulfill our needs with innovative. They focus on everyday objects that bridge function and aesthetics. Creativity is also a unique solution that creatively resolves a problem, addressing both form and function. Creativity is infused in design education by applying abstract thinking and imagination through brainstorming to generate a variety of possible solutions. Design merges two modes of thinking: creative and analytical cognition. The creative part of designing is not just the introduction of something new but also the way in which that leads to a result that is unexpected and valuable.

One of the greatest strengths of the arts is that they can enhance the quality and meaning of people's lives. The arts serve as wellsprings of inspiration and a celebration of the multifaceted human spirit. Immersion in artistic endeavors can fortify our individual identities, facilitating the discovery of our distinct voices. When rooted in relatable contexts, artistic processes possess the power to be truly transformative. They can open new doors, extend personal boundaries, enable us to see past traditions in new ways, and provide opportunities for us to redefine who we are in our current fractured world. Art appears to offer a doorway beyond mere perception.

- Encouraging innovative approaches to performance that broaden access to high-quality artistic experiences and engage audiences from diverse backgrounds.
- Fostering the creation of new works, artistic forms, and languages that resonate with a wide range of audiences.
- Exploring the cultural significance and contribution of vernacular elements within contemporary culture.
- Utilizing participatory processes to nurture creativity across various contexts.
- Establishing a unified framework for evaluating and assessing quality in all artistic activities, considering diverse needs and purposes.
- Creating opportunities that promote quality, accessibility, diversity, and adaptability within an inclusive environment.
- Establishing fresh performance venues and spaces that attract novel audiences.
- Expanding artistic practice by investigating the interconnectedness of various disciplines, technologies, and art forms.

- Prioritizing research and ongoing professional development as the driving forces behind an institution's artistic and educational endeavors.
- Positioning each training institution as a versatile resource for the professional arts community, the educational community, and the broader society.

Modifications to curriculum and pedagogical approaches, in isolation, cannot fully tackle the fundamental challenges that professional training faces. Achieving the essential transformation demands a substantial shift in the culture and mindset of each institution. For this to be realized in practice, strong visionary leadership needs to create an environment in which honest, open, critical dialogue is respected and actively encouraged. Every individual's perspective deserves recognition. In a world marked by increasing cultural diversity, the capacity to connect, honor, and embrace varying viewpoints is indispensable for both personal and institutional dialogues. It is imperative that all educators, learners, and young individuals in the educational realm are esteemed and experience their voices being acknowledged within a culture of shared accountability and mutual interdependence.

Teaching Practice

Creativity is the learning target of the 21st century in order to solve complex problems in our world. Designer work is basically about solving ill-defined and obscured design problems.

According to Cross (1982), design is defined as 'the conception and realization of new things', that have utility or value for a user, client, or customer. While designing any product, designers have to collect various factual and visual data to create something by blending aesthetics with function. The designer has to plan a roadmap, constantly make changes with new ideas, and create something. Instructors are supposed to have been exposed to various teaching methodologies and assessment techniques that can be used to cater to students' diversity. Teaching methodology has to focus on the design process. This discipline demands enhancing the learning process to improve metacognitive skills.

Studio Pedagogy

Every artist needs a space to experiment and visualize his ideas. He applies various mediums and techniques to shape his ideas and give them a look. That space is known as a studio. The studio is an equipped space dedicated to production. It is a zone created and formulated by designers with the equipment and techniques to originate something new and innovative and make those spaces more complex to examine and define where connections are made to discover something unknown.

The studio is a place for testing design concepts. To investigate a process of creating new design compositions and making connections possible from the known to the unknown. Multidisciplinary collaboration and material exploration are the main components of studio pedagogy. Studio pedagogy involves inquiry-based actions and incorporated practices, integrating self-reflection, learning by doing, and learning under the guidance of an instructor to educate emerging designers.

The studio is the term used for a learning environment within which design students actively engage in creative work under the guidance of an instructor. Learning by doing and reflection in action are the main characteristics that base studio pedagogical practices through projects ending in a public presentation for critique. Data gathering and collection is the leading step of studio work. Studio involves discussion with yourself and expertise and competence. It is a debate between

knowledge and ideas, and one has to be ready for negotiation and surprising results.

An artist has to isolate himself to give depth to his ideas and connect to the world at the same time. The artist has to connect his isolation with worldly distractions outside. The studio is a door to creative accomplishment. The studio is also a producer of cultural artifacts. Studio pedagogy is an essential method to educate emerging designers. It fosters creativity through a comprehensive and in-depth working process and involves an innovative and holistic approach. Studio teaching methodology aims to develop design thinking, construction, and critical thinking skills.

Divergent thinking and flexibility

Epistemological understanding of students is measured by instructors to constitute a good design. Instructors adapt various ways of knowing and decide what is worth knowing to visualize students' ideas. And it could be enhanced by the collaboration of students with faculty.

Critique is an apparatus for assessment and cultivation in the profession. It's required to develop facilities with a design process to enhance studio-based learning through practice and offer students the tools to learn. The academic studio offers a professional community of practice.

The academic studio is associated with the curriculum of design. The studio is a space accessible to all students where instructors' brief projects and assignments and students have to make their work examined at different points where professors and peers discuss and evaluate their efforts, techniques, and ideas.

Design Thinking

In our interconnected global economy, it is imperative to prepare students to possess a holistic skill set that includes strong collaborative abilities and the capacity to engage in critical, creative, and pragmatic thinking. Quality thinking can be described as the harmonious blend of critical, creative, and practical thinking skills and inclinations, used with depth and intricacy, as articulated by Vanada (2011).

Design thinking is a cross-disciplinary concept that serves as a framework for comprehending art while fostering a distinct cognitive equilibrium involving creative problem-solving, aesthetic considerations, and conceptual approaches in the realms of art and design, as articulated by Davis (1999).

Within the academic community, design thinking is recognized as a learning approach that encompasses a range of activities such as hands-on projects, inquiries, investigations, sketching, prototyping, collaboration, feedback, and reflective analysis, with the possibility of revising initial concepts or products. Burnette (2005) introduced his 'Design for Thinking (iDESiGN)' model, which outlines seven distinct modes of thinking: intending, defining, exploring, suggesting, innovating, goal-getting, and knowing. Consequently, design thinking can be succinctly described as a "cross-disciplinary creative problem-solving process" that combines analytical and creative thinking with practical skills, as expounded by Vanada (2011, p. 22-24).

As a mindset, design thinking methodologies are a valuable resource for artist-teachers seeking to enact constructive change and address the design-related issues they encounter on a daily basis. These challenges span diverse areas, including curriculum development, feedback mechanisms,

fostering thinking cultures, and tailoring problem-solving approaches in studio art and pedagogical contexts, as discussed by Daichent (2010). Design thinking, in this context, functions as a creative and introspective instrument, enabling educators to approach teaching with a dual role—as both artists and designers of thought within the classroom. It also serves as a model for shaping enriching learning experiences and encouraging collaboration.

According to Craft (2006), creativity can be defined as a form of thinking that embraces the realm of possibilities. Craft's framework comprises seven key habits of mind: questioning, playfulness, immersion, innovation, risk-taking, imagination, and self-determination. As a pedagogical approach, design thinking processes play a crucial role in nurturing students' capacity for creative problem-solving. This involves a blend of inductive and deductive reasoning, coupled with intuitive or abductive thinking. Additionally, design thinking facilitates concept development through ideation and brainstorming, promotes collaboration and risk-taking, and enhances craftsmanship with a focus on empathy and profound meaning, as discussed by Kolko (2010).

In the realm of education, the pedagogy of design thinking advocates for educators to depart from the confines of traditional, inflexible learning methods. Instead, it encourages the adoption of brain-based strategies that harness the power of forging connections, fostering inquiry, and facilitating self-directed learning, a perspective well-explored by Caine and Caine (1997), and Vanada (2011).

Teaching Contents of Art Design Theory

Art courses prioritize the development of students' practical skills over fundamental theoretical knowledge. Design artists should not only have skilled art design skills but also have solid knowledge of art design theory to enrich and improve their personal artistic accomplishments. The instructional content of art design theory primarily encompasses topics such as design fundamentals, aesthetics in design, design thinking, research in design psychology, theories of design art history, and the cultural aspects of design, among others. It plays a guiding role in cultivating students 'innovative ability.

Studying the course on art design theory provides the following benefits:

- To exercise the ability of designers to discover, analyze, and solve problems.
- It helps to improve the ability of designers to appreciate art and criticize and correct art, to shape and improve the comprehensive design art accomplishment of designers, and ultimately to enhance the core competitiveness of art talents in the market and to better adapt to market demand.
- Emphasizes the cultivation of students 'understanding of theoretical knowledge and the way of thinking to solve problems.

Art design theory is the premise and foundation for cultivating and improving the creative ability of art design. It streamlines the exploration of theory in art design innovation, offers valuable experiences in artistic design innovation, and equips artists with a wealth of mature knowledge in art theory to inform their designs. We should innovate teaching methods, constantly cultivate students 'theoretical thinking ability, and enhance the ability of artistic innovation and application. neglects the importance of theoretical teaching. Generally, theoretical knowledge teaching emphasizes the systematicness and theory of knowledge, but art majors generally have the characteristics of well-developed thinking in images and poor logical thinking. Professional teaching

Art practice involves a combination of theoretical knowledge and technical skills. The monotony of teaching methods directly leads to the singularity of the assessment methods of artistic theory. Examinations become the ultimate goal of teaching, while students pass the examination by rote memorization of knowledge points. Students and teachers do not communicate in the classroom but regard the teaching of theory courses as a task. Students lose the motivation for learning, so they cannot effectively cultivate and improve the ability for independent innovation.

Constructivism

John Dewey presents a novel theory concerning art and the aesthetic encounter. Dewey proposes that there is a continuity between the refined experience of works of art and everyday activities and events, and in order to understand the aesthetic, one should start with the everyday events and scenes. Constructivism emphasizes the experience of the learner as integral to problem solving. Learner experience is the main concern of constructivist and Dewey theories, both of which are interdependent. The main strategy in constructivist planning is to connect information to the child in as many ways as possible. The main strategy in constructivist planning is to connect information to the child in as many ways as possible.

For Dewey, experience is a natural phenomenon not outside of the human species but completely inside of it as part of our evolutionary make-up. Experience refers to the manner in which living organisms engage with their surroundings. In the case of humans, their environment encompasses social, cultural, and political aspects.

Visualization

Visualization plays a pivotal role in the creation of mental imagery for things that are either imperceptible or nonexistent. Vivid mental images often elicit strong corresponding emotions. This blend can transform visualization into a potent educational tool, though its use must be approached with care and sensitivity. Visualization can be employed to reinforce course content. However, for students to effectively enhance their comprehension through mental images, they require prior knowledge and thoughtful guidance. This form of visualization, when guided, is sometimes referred to as guided imagery. To facilitate this type of visualization, the instructor should possess a script, whether written or mental, outlining the images to be conveyed. Bagley (1987) suggested that imagery can also be harnessed for creative problem-solving. It has the potential to stimulate unconventional connections, metaphors, or innovative perspectives on the issue at hand. In each scenario, visualization is utilized to activate novel ideas and viewpoints.

Incubation Model

This strategy, developed by Torrance and Safter (1999), is a comprehensive approach to teaching creative thinking. It encompasses not only the rational cognitive processes that can boost creative thinking but also the more intuitive "supranational" processes that can lead to moments of insight and revelation. In this method, students primarily employ their information and creative thinking skills to deduce conclusions, resolve issues, or explore alternative approaches. Torrance and Safter (1999) depicted the creative process as a means of searching for information or solutions.

Project-centered learning

Art and design learning is both constructive and productive. In project-centered learning,

students experience and direct the learning. In project-centered learning, students become active agents of their discipline, increasing ownership of their learning experience. project-based learning as a form of experiential learning, which encourages students to engage in problem-solving processes through hands-on experience and through interaction with each other and with the content, which is often multidisciplinary in nature (Wurdinger, 2010). In relation to task specification, learning projects are driven by a complex real-life problem or a question, which takes a considerable length of time and amount of work to resolve. Ideally, students would be confronted with carefully scaffolded real-life problems or questions of increasing complexity all through their education in order to facilitate their development from novices to experts. A second feature of learning projects is the production of an artifact, which helps students learn the creation process by working through this process from start to finish. Project-based learning is learning by doing. In project-based learning, the student assumes control of the process. This allows students to engage their previous knowledge and experience and work through the project in their own way, which supports their knowledge construction and expertise development processes.

Experiential Learning

It is based on experience and observation. Experiential learning is the educational process rooted in learning through direct experience, or more specifically, learning by reflecting on one's actions. Hands-on learning can be a form of experiential learning but does not necessarily involve students reflecting on the product. Hokanson and McCluske (2016, p. 180–187) have investigated creativity habits with their experiential studio course, 'Creative Problem Solving'. Their goal was to develop each student's creativity by training them with the assignments integrated into the students' everyday lives. The series of challenges was composed with the idea of "doing something different."

Collaborative Approach

Collaborative art-making proved to be efficient in assisting teachers to effectively transfer to students' inclusive values like respect for the 'other' and acceptance of difference (Agelides & Michaelidou, 2009). Research has shown that as collaborative art-making can help students see things differently, certain power relations (economic, gendered, and ethnic) can be altered (Cooper & Sjostrom, 2006). Students can come closer to each other, understand each other's emotions, see their peers from a human perspective, and think deeper about their classmates regardless of race, ethnicity, or social class (Rubin, 1997). Collaborative art-making helps students not to simplify human emotions and behavior but to see their peers as human beings and, as a result, to begin trusting them (Fattal, 2014)

Co-learners

Underpinning art and design education is the expectation that students will develop their own creative development of the subject. Students are encouraged to experiment and explore, generating a variety of responses to projects rather than striving for correct answers. Tutors there-fore appear to see themselves as co-learners with their students. The tutor is therefore in a position of facilitator or co-researcher, and this requires the suspension of preconceived ideas and outcomes for a project. Fostering a climate of discovery for each individual student is paramount. When instructors prioritize the quality of the final product, they may inadvertently overlook students whose work remains incomplete but who are actively engaged in the ongoing work process. Given the crucial role that the process plays as a significant learning outcome, the focus should shift from evaluating

the student's products, as suggested by Cornock (1984, p. 145–146), to the evolving process itself. A successful journey through the creative process necessitates that students reflect upon and articulate their unique process. Their intentions should be transparent within their work, and students should be adept at elucidating the intended meaning. Instructors often encourage students to "explain the process, not just the product," as emphasized by Dannels (2005, p. 149).

Learning involves living with uncertainty and unknown outcomes. Managing or dealing with the unknown can present a challenge for students (Austerlitz et al., 2008), and it also applies to instructors, who must be ready to embrace and trust their students' ideas.

According to Shulman (2005), the process of acquiring expertise in professional practice requires the cultivation of 'pedagogies of uncertainty.' In these pedagogies, practitioners learn to establish connections among ideas, practices, and values, enabling them to make informed judgments and take appropriate actions. This can be a demanding situation for tutors, as they must navigate uncharted territory while simultaneously offering guidance to students who may be considering high-risk endeavors that may not necessarily yield success. Navigating this inherent uncertainty is a routine aspect of teaching within the realms of art and design. In these fields, there are no predetermined answers; instead, there are outcomes that demand creative solutions while still remaining integral to the disciplinary framework. Tutors play a crucial role in assisting students in managing this uncertainty and crafting their unique trajectories within the discipline. However, this process can blur the lines of dialogue and 'exchange,' giving rise to what can be termed a pedagogy of ambiguity, as suggested by Austerlitz et al. (2008). Conversations often revolve around the continuous evolution of students' projects, occurring within the context of peer-to-peer interactions or interactions between students and their tutors. This public sharing of work represents a vital component of engaging with practices that reside on the fringes of the community, akin to a form of legitimate peripheral participation as described by Lave and Wenger (1991). In this learning environment, the social dimensions of the practice take center stage, unfolding in an experiential manner.

RESEARCH METHODOLOGY

The objective of this study is to investigate the teaching methods employed in design education. The study focuses on teaching methodology and strategies to enhance creativity and critical thinking. A qualitative research design is used in this study, incorporating document analysis and thematic analysis.

The data is collected by document analysis and literature review. The findings will provide valuable insight and strategies to advance their creativity and independent thinking.

Data Analysis and Discussion

This research aims to measure creativity and discover teaching strategies to develop creativity among visual art field students. Creativity doesn't have any parameters. Literature on the education of design professionals highlights a prevalent sense of discomfort experienced by many individuals in the field. Design education should make students reflective practitioners. Design education focuses on objective creativity. In visual art, the studio is king. Instructors must focus on studio pedagogy.

I have answered research questions through document analysis and thematic analysis.

What pedagogical beliefs and practices are found in art and design education?	The teaching approach is adaptable, without rigid constraints, and characterized by improvisation.
	The students are engaged and self-reliant.
	The educational setting constitutes a collective community of practice.
	Project assignments and classroom methodologies are intentionally crafted to foster creativity.

As indicated in the aforementioned research, pedagogical approaches are purposefully structured to facilitate the mastery of the creative process. These practices are characterized by a constructivist, open-ended orientation that prioritizes student-centered learning. Instructors actively strive to establish a community of practice in which they assume a peer role alongside the students. The environment encourages experimentation and risk-taking. Classroom sessions are marked by flexibility and improvisation. Furthermore, the capacity to engage in the creative process is a significant component of the evaluation process, as outlined by Sawyer (2017, p. 105-111).

What instructional methods are employed to foster this particular understanding of creativity?	Creativity emerges as a "result" of the activities in which students have engaged.
	A thoughtfully crafted assignment presents an open-ended problem.
	Every student is required to discern their individual path to a solution.
Conceptual-categories	Flexibility in assignments
	Constraints in assignments
	Project management
	Assignments grounded in concepts.
	Highlighting processes and material exploration.

Educators hold the belief that they cannot directly instill creativity, but rather, they can nurture creativity by offering guiding frameworks. They act as facilitators, providing students with a structured foundation and creating an environment where they can expand their creative potential. These structured frameworks are often referred to as assignments or projects, enabling students to progress through a scaffolded creative process. “Learning art, that is, learning how to construct and critically evaluate these representations, requires scaffolded instruction in the representational process. Arts-based learning environments engage participants in authentic production tasks guided by explicit pedagogical practices." One of the primary findings suggests that students are believed to acquire a deeper understanding of the creative process when they engage in discovery, exploration, and active learning within a nonlinear, iterative procedure while consistently working with materials throughout the entire process, as outlined by Sawyer (2018, p.154–160).

Educators hold the view that constraints can actually boost creativity. Thoughtfully crafted project constraints serve to direct the learning process towards a specific objective. As John Hendrix, an illustrator, stated, "a good project has severe constraints," indicating that constraints can paradoxically promote creative freedom. When assignments lack sufficient constraints, students often find it challenging to initiate their work. This practice of incorporating constraints in assignments aligns with research on the creative process, which suggests that tasks with limited constraints tend to yield less creative results. This is substantiated by experimental studies, such as those by Costello and Keane (2000) and Moreau and Dahl (2005).

Learning outcomes	Creativity
	To attain proficiency in a fundamental set of foundational technical abilities.
	To grasp the art of effectively engaging with an audience or observer.
	Developing visual perception.
	"Developing critical thinking" as a significant educational objective.
	Creativity, Analytical thinking and problem solving.
Non-Cognitive and Personality outcomes	Capacity for self-directed work.
	Persistency and self-assurance.
	Learning to express oneself.
	Developing as individuals.
	Educators assist students in nurturing their individual identities.

The primary learning outcome of utmost significance revolves around the conceptualization of the creative process. This perspective considers creativity as a purposeful journey consistently yielding successful creative results. The process is inherently open-ended, yet it necessitates that creators cultivate decision-making skills and focus while they navigate through experimentation and self-discovery.

For novice students, the initial challenge lies in their ability to truly "see." Often, they tend to concentrate on the tangible artifacts they are producing. However, true "seeing" involves perceiving the invisible spaces formed by what is visible. These negative spaces impact viewers, but most individuals are not consciously aware of this phenomenon. Artists, designers, and architects must learn to recognize and intentionally manipulate these spaces to create their intended impact.

Nature of Creative process.	Creativity is closely linked to divergent thinking.
	Flexibility
	The most exceptional ideas arise from engaging with the materials of the field rather than preconceiving ideas.
	It is slower and longer process.

An approach frequently employed by educators to deter students from prematurely fixating on a single idea is to initiate an assignment by mandating the generation of numerous possibilities and potential avenues for progress. This technique serves to broaden students' thought horizons, discourage premature fixation on a single concept, and prompt the continuous generation of fresh ideas. Working with diverse materials tends to stimulate the emergence of various ideas, thereby enhancing the learning process. This approach aligns with a substantial body of research emphasizing that effective learning is contingent upon investing time and maintaining sustained focus, as exemplified in studies such as those by Brown, Roediger, and McDaniel (2014).

Nature of Interaction practice	Educators fostered reflection among students by engaging them in detailed discussions about their ongoing work.
	Learning to perceive not only their own work but also how to appraise the work of others.
	“Question, Explain, and Evaluate”

Educators motivated students to contemplate their ongoing work through in-depth discussions that delved into their journey to the current stage, their present actions, and their prospective steps. This not only aids in enhancing their discernment of their own work but also in developing the

ability to assess the work of others. It serves as a platform for cultivating decision-making skills.

Research in the field of learning science has shown that the tangible nature of physical artifacts renders visible the evolution of students' comprehension, thereby bolstering their metacognitive and reflective capacities (Winne & Azevedo, 2014).

Classroom Practice	Classroom methodologies steer students towards engaging in experimentation within an environment of uncertainty.
	Classroom methodologies assist students in leveraging failure as a stepping stone to propel the process forward.
	Classroom methodologies instruct students on how to discern these discrepancies and utilize them as sources of inspiration for fresh ideas and alternative directions.
	In classroom practices, educators seldom express their personal opinions about the work; rather, they facilitate students in uncovering their own aesthetic perspectives.

Students were urged to heighten their awareness and intentionality in their creative processes.

Embodied practices (in learning creativity)	Material exploration
	Socio-materiality
	Practice-led research process
	Reflective nature

Embodied cognition finds its origins in phenomenology, asserting that our perception of the world is shaped by our senses and that our accumulation of knowledge occurs through our interactions with the environment. Sociomateriality, on the other hand, is a theory concerning the interwoven relationships between technology, work, and organization. It endeavors to comprehend the inherent interconnection of the social and the material. Grounded in philosophy and sociology, this theoretical framework posits that the social and the material are intricately linked—there exists no purely social realm that is devoid of material elements, and conversely, no purely material aspect devoid of social influence, as articulated by Orlikowski (2007, p. 1437).

Pedagogical balance	Guidance (related to students)
	Planning (Time management)
	Maintaining (Responsibilities and Monitoring).
	Resourcing and Learnercenterness.
	Collaborations and Strategical directions

Pedagogical elements	Concept based assignments
	Material explorations/Experiments
	Emphasizing process

Design Process	Planning Thinking/Brainstorming
	Selection of theme
	Visual research
	Composition
	Design ideation (Collecting, sketching and experimenting)
	Concept development

	Mood board
	Generating and transforming representation of objects.
	Inventing
Tactile experience and material exploration	
	Developing variation of techniques
	Sampling/Sample swatches
	Creating
Goal directed production	
	Final product

In the design process, this phase involves the exploration and arrangement of intriguing features and ideas, evoking curiosity. Creativity encompasses different approaches to existence and interactions with the world, as described by Henriksen, Mishra and Fisser (2016, p. 13-18). The very concept itself serves as a creative expression, functioning as a vehicle for organizing mental images and guiding individuals toward their material explorations.

CONCLUSION

This study emphasizes the importance of choosing appropriate teaching methodologies that can enhance students' learning outcomes and prepare them for professional practice. Creativity flourishes through the sparks of curiosity, the fuel of motivation, and the depths of engagement. It encompasses the realms of critical thinking and the art of problem-solving.

The design process commences with a preliminary yet loosely defined objective. Creators operate in an improvisational manner, remaining open to unforeseen opportunities that arise during their interactions with the medium, as discussed by Halverson and Sheridan in 2014, as well as Kafai, Fields and Searle (2014). In cases where instructors prioritize the quality of the end product, students who have not yet completed their work but are still actively involved in the process may be overlooked. Given that the process itself holds substantial educational value, it is suggested that the emphasis shift from evaluating the students' final products, as proposed by Cornock (1984, p. 145–146), to a more pronounced focus on the students' evolving creative process.

Design researchers have pinpointed the recurring elements of an iterative process, commencing with exploration, ideation, problem identification, and articulation. This is followed by the creation of drafts, sketches, and prototypes, accompanied by the analysis and contemplation of these initial externalizations. The process entails successive cycles of iteration, as expounded by Cross (2011) and Halverson and Sheridan (2014). Empirical investigations into artistic production have been relatively scarce. Similar to studies on the design process, these examinations indicate that art creation follows a nonlinear trajectory, with concepts and images arising from the act of engaging with materials. This is substantiated by research from Getzels and Csikszentmihalyi (1976), Botella, Zenasni, and Lubart (2011), Mace and Ward (2002), and Sawyer (2016). The emerging fashion pedagogy is closely intertwined with textile studios and amalgamates implicit and tactile knowledge with pedagogical experimentation rooted in materials. This synergy has given rise to a novel form of textile thinking, facilitating profound comprehension and the generation of fresh knowledge, as illustrated by Salolainen, Leppisaari, and Niinimäki (2018).

The study recommends that design educators should adopt a student-centered approach to

teaching and focus on creating engaging and challenging learning experiences for their students.

RECOMMENDATION

- Pedagogical practices in design education should be based on constructivist principles, it is open-ended in nature and student centered.
- Classroom sessions ought to be adaptable and spontaneous. Experimentations and risk taking should be encouraged.
- Instructors should focus on divergent thinking and encourage students to produce novel ideas.
- Educators should prompt students to engage in reflective discussions regarding their ongoing projects.
- Students should be taught how to see, observe and think critically.
- Experiments with different materials and techniques should be part of their practice.
- Instructors should emphasize on process also and students should be encouraged to be more conscious and deliberate with their process to do quality work.
- Concept based assignments should be assigned to students.
- Pedagogical practices should be reflective in nature.
- Students should focus on research work.

These recommendations aim to improve students' engagement and pedagogical practice by incorporating most effective methods for teaching design and to provide insights for improving design education.

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