A Study on Digital Platform Integration for Design Innovation

Upeksha Hettithanthri [1], Deshaja Dewapriya[2]

[1,2] *NSBM Green University, Homagama, Pitipana, Sri Lanka*
upeksha@nsbm.ac.lk
deshaja.d@nsbm.ac.lk

ABSTRACT

Fostering creativity in design education is essential to prepare students for the evolving demands of the industry. This study investigates the impact of innovative teaching techniques, specifically the use of digital platforms, on enhancing creativity within design pedagogy. Conducted with 25 interior design students in five groups, the study explores how collaborative digital tools, such as MURAL and SketchUp, influence students' design processes, ideation, and prototyping. Observational data indicated that these tools facilitated rapid development of creative ideas and refined designs, suggesting that integrating digital platforms in design education enhances students' collaborative creativity and practical problem-solving abilities.

Keywords **– Innovative tools, design process, online platforms**

1. INTRODUCTION

Design education is placed at the center of the design education (Afacan, 2018). In current context, many digital platforms are available to support the design process of students (Yurtkuran et al., 2013). This study is focused on exploring the integration of digital platforms to foster creativity of students. In today's dynamic design landscape, creativity remains a core skill for design students, particularly in fields like interior design, where solutions need to be both functional and aesthetically pleasing (Açikgöz, 2015). As the role of digital tools expands, there is a growing need to understand how these platforms can be integrated into design pedagogy to enhance students' creative thinking and design processes. Through this study , we examined the use of digital platforms, MURAL and SketchUp, in fostering creativity among interior design students by facilitating ideation, prototyping, and collaborative decision-making.

* Corresponding author – NSBM Green University, Homagama, Pitipana, Sri Lanka

E-mail address: upeksha@nsbm.ac.lk

2. CREATIVE THINKING

Creative thinking in design education is essential for developing innovative solutions that respond to user needs and aesthetic principles (Alawad, 2014). Prior studies have shown that digital tools offer unique advantages in design education, such as flexibility, real-time collaboration, and access to a wide array of resources (Abeer Alawad et al., 2021; Al-Qawasmi, 2005). Digital platforms like MURAL and SketchUp have emerged as valuable tools for fostering creativity and collaborative learning, allowing students to visualize, iterate, and refine their ideas quickly.

2.1 Digital platforms for collaboration and prototyping

For this study we used MURAL, which is a collaborative design platform which supports online, distance collaboration. MURAL platform facilitates real-time collaboration, brainstorming, and ideation. It offers an array of visual tools, including sticky notes, templates, frameworks, and diagramming capabilities, which allow users to structure and share their ideas with others seamlessly.

The other digital tool used is Sketch up platform. Sketch up is a digital prototyping tool which is supportive in designing digitally. In design education, SketchUp helps students translate 2D concepts into 3D models and experiment with design elements in real-time.

3. PROBLEM STATEMENT

Even though, many collaborative and prototyping techniques available in design pedagogy, it is important to investigate how these could support on fostering creativity of students.

3.1 Research Question

1. How the digital collaboration contributes on developing novel ideas among students?

4. RESEARCH METHODOLOGY

The study was conducted with 25 third-year interior design students. To facilitate group-based collaborative work, the students were divided into five groups of five. The study employed a qualitative observational approach to assess the impact of digital tools on students' design processes (Charmaz & Henwood, 2019). Each group was tasked with a design challenge that required them to ideate, prototype, and refine interior design concepts over a series of sessions. The groups were instructed to use MURAL for ideation and brainstorming, and SketchUp for prototyping and 3D visualization. Students were given six studio days to complete their design projects. During this period, the groups were observed to assess how they utilized the digital tools to develop and refine their ideas. Data were collected through direct observation, student reflections, and group feedback sessions.

4.1 Data Analysis

Observational notes, student feedback, and digital artifacts from MURAL and SketchUp sessions were analyzed to assess changes in creative output, collaborative dynamics, and design quality. The study used a thematic analysis to identify patterns in how the digital platforms influenced group creativity and the overall design process.

4. RESULTS

Themes	Categories	Codes
Innovative idea development	Diverse perspectives	Shared insights
		Varied design influences
		Rapid brainstorming
	Idea generation	Many shared information
		Free and joyful engagement
		Developing non-conventional ideas
	Risk taking	Safe space for experimentation
		Testing non-conventional ideas
Real time collaboration	Instant feedback	Peer review
		Real time feedback loops
	Collective problem solving	Joint decision making
		Building on others' ideas
	Group Cohesion	Equal contribution
		Sense of ownership
Idea visualization	Concept Mapping	Visual mind maps
		Structuring and organizing ideas
	Prototyping and refinement	3D modelling and adjustments
		Iterative development
Skill development	Digital Proficiency	Learning to use new platforms
		Skill building on digital tools
	Collaboration skills	Effective communication
		Remote teamwork
	Feedback integration	Adopting based on feedback
		Self-assessment and growth
Enhanced creativity	Innovative problem solving	New approaches to tasks
		Cross disciplinary thinking
	Originality	Out of the box thinking
		Testing solutions

Table 1. Table of codes, categories and themes

The results of this study are presented based on thematic analysis, which identified key themes, categories, and codes reflecting the impact of digital collaboration on fostering creativity in design education. The thematic chart revealed five primary themes: Innovative idea development, Real-Time Collaboration, Idea Visualization, Skill Development, and Enhanced Creativity. Each theme is described below, with findings substantiated by the observed behaviors and feedback from participants.

Digital collaboration significantly contributed to creative ideation among students by fostering an environment rich with diverse perspectives and rapid idea generation. Students expressed that sharing

insights from different backgrounds and design influences helped broaden their thinking and expand the range of ideas considered. Working collaboratively with peers introduced varied viewpoints, which encouraged students to step out of their own design paradigms and explore new, innovative directions.

Real-time interaction on digital platforms played a crucial role in enhancing group cohesion and collective problem-solving abilities. Students appreciated the immediate feedback loop provided by the platform, which enabled them to evaluate and improve ideas in real time. Peer review and instant suggestions enriched the design process, as students could refine their concepts based on constructive input from others.

The digital workspace encouraged equal participation, with each member contributing actively to the project. Students expressed a sense of ownership and commitment, which enhanced group cohesion and fostered a stronger sense of shared purpose in their projects.

The use of digital platforms enabled students to map and visualize their ideas, leading to clearer concept development and prototyping processes. MURAL allowed students to create mind maps and organize ideas visually, which made it easier to identify connections and relationships between concepts. This spatial organization helped students structure their thoughts more effectively, leading to coherent and comprehensive design proposals. SketchUp, used for 3D modeling, facilitated a seamless transition from conceptualization to tangible design. Students were able to rapidly create prototypes and make iterative adjustments, refining their designs as they progressed. This iterative approach contributed to the development of higher-quality, more thought-out final products.

The study found that students developed both technical and collaborative skills through their engagement with digital platforms.

5. DISCUSSION

The results indicate that digital collaboration platforms play a significant role in fostering creativity among design students. By providing tools for ideation, visualization, and real-time feedback, platforms like MURAL and SketchUp enable students to develop novel ideas, refine their designs, and build essential skills for future professional practice. These findings suggest that integrating digital collaboration into design education not only enhances students' creative output but also prepares them for the collaborative nature of modern design industries.

This study supports the integration of digital platforms into design pedagogy as a means to foster creativity and collaboration. The observed impact on student creativity and the rapid development of well-formed design ideas suggest that digital tools offer substantial benefits in design education. Future research could expand this study to include other digital tools and assess their impact on different design disciplines.

REFERENCES

Abeer Alawad, Abeer Alawad, & Abeer A Alawad. (2021). Evaluating Online Learning Practice in the Interior Design Studio. *International Journal of Art and Design Education*. https://doi.org/10.1111/jade.12365

Açikgöz, E. K. (2015). Uncovering creativity: Structuring experience in architectural design

studio. *Open House International*, *40*(2), 12–21. edselc.

Afacan, Y. (2018). Student Experiences of Blended Learning in Interior Architecture. *Journal of Information Technology Education: Research*, *17*, 399–422. eric.

Alawad, A. A. (2014). What approach can we develop to improve creativity in design? *Life Science Journal*, *11*(6), 140–146. edselc.

Al-Qawasmi, J. (2005). Digital media in architectural design education: Reflections on the e-studio pedagogy. *Art, Design & Communication in Higher Education*, *4*(3), 205–222. ufh.

Charmaz, K., & Henwood, K. (2019). *The SAGE Handbook of Qualitative Research in Psychology* (By pages 238-256). SAGE Publications Ltd. https://doi.org/10.4135/9781526405555

Yurtkuran, S., Kırlı, G., & Taneli, Y. (2013). An Innovative Approach in Architectural Education: Designing a Utopia. *Procedia - Social and Behavioral Sciences*, *89*, 821–829. ScienceDirect.