

EDUCATIONAL NODES AND HUMAN NETWORKS: NEGOTIATING RESILIENCE IN INTERIOR DESIGN PEDAGOGY

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ABSTRACT

Educational institutions function as critical nodes within the larger urban framework, acting as the intellectual infrastructure responsible for shaping the designers of tomorrow's cities. However, this academic ecosystem faces disruptions akin to those affecting urban mobility, specifically through global uncertainties such as pandemics and the rapid encroachment of Artificial Intelligence (AI) on human talent. This paper investigates the institutional set up and faculty support systems necessary to negotiate these challenges and foster true resilience within Interior Design academia. The research argues that the current rigid networks of education must evolve into an improvised configuration of learning, defined by "Flexible Design Thinking". To counter the digital saturation of AI, the curriculum should incorporate hands-on experience (including knowledge of traditional crafts) to fill the voids that technology cannot address. The paper highlights that while curriculum forms the physical structure, faculty mentors act as the essential social network hub that imparts authenticity which makes the framework resilient to change. Drawing from case studies of academic infrastructure that withstood systemic shocks, the paper outlines a blueprint for institutional survival. It concludes that by fostering an adaptive study environment, academia can produce resilient designers capable of navigating the complex realities of future urban and interior environments.

KEYWORDS: Educational Nodes, Academic Infrastructure (set up), Social Networks in Pedagogy, Interdisciplinary Structure, Educational Resilience, Artificial Intelligence, Traditional Craft vs. Voids.

INTRODUCTION

Educational institutions are vital parts of the urban fabric, acting as the intellectual backbone that prepares and shapes the designers who will create tomorrow's cities. This paper is based on the Institutes that conduct Interior Design education. Just as urban mobility systems face difficulties like political, economical and climatic changes, Interior Design (ID) academia faces disruptions due to encroachment of Artificial Intelligence (AI) on human labour and global uncertainties like pandemics (eg. COVID 2019). The hampering of regular classes (in person) due to COVID 2019 upset the learning pattern of enrolled students in the institutes, at various stages of learning. This is very well emphasised and put forth by Dana Khalid Amro (*ref2*). AI tools can now generate interior layouts/plans, material palettes, mood boards and 3D visualizations within minutes. These are tasks that students ideally should be traditionally learning through manual drafting, iterative design thinking with constant supervision and feedback from faculty. The imperfect balance between digitization and the irreplaceable value of human embodiment, craft sensibility, and tactile knowledge raises urgent questions like, "How must an ID institution relook at its infrastructural and educational setup to endure shocks while maintaining fidelity to its disciplinary core?", "What roles do faculty and curriculum play in cultivating resilient designers who can cope with complex futures?" This paper proposes 'Flexible Design Thinking' (FDT) as a solution. It contends that to counter the saturation of AI in creative work, curricula should foreground hands-on experience, embodied making & knowledge of traditional crafts-areas where technology cannot wholly replicate human intention, tactility and cultural memory. Drawing on a case study of academic infrastructures that withstood systemic shocks (*ref8*), the

paper offers a blueprint for institutional survival and transformation. The overarching claim is that by cultivating an adaptive study environment and robust social networks (faculty) within pedagogy, interior design education can produce resilient designers capable of navigating the complex realities of future urban and interior environments.

AIM/PURPOSE

The burgeoning focus on the role of the adaptable curriculum, institutional support, and role of faculty aims towards the mental well-being of the student (and the student's ability to stay relevant as the "leader of design"). The ID departments celebrate the achievements of their Alumni. The Alumni can be called truly successful if they fit into the definition of resilience (*ref1*): a)'bouncing back' to perform in spite of adversities faced in design projects; (b) undergoing adaption without significant loss of function during setbacks faced in design projects; (c) growing overtime as a tolerance or 'a thicker skin' to adversities/uncertainties faced, and; (d) deliberately building peer networks across the design discipline and beyond for collective support.

As per (*ref2*) the empathy and understanding are very important between students and instructors to achieve success comfortably even with the difficulties brought on by the COVID 2019 pandemic. The fundamental change resides in the ability of Design education to train conscious designers equipped with the tools to discern the evolving societal, technological, and environmental landscape, and the capacity to think critically and affirmatively. That is, understanding complexity but also being able to imagine and open alternatives (*ref3*). In our quest for novel and transformative design pedagogies, we

should advocate for a range of potential perspectives including alternatives to closure of classrooms during crisis, interaction with skilled craftsmen, controlling the AI invasions and a transdisciplinary approach to curriculum.

RESILIENCE

This paper highlights the crucial role of educators in shaping and guiding the way students think and approach design. The right blend of soft skills, AI, hands-on and practical experience are small steps towards making a student resilient. The student at the end of his/her academic journey should resonate with the words, as described by Nick Ervinck (a Belgium Sculptor projecting art history to pop and sci-fi images, owner of studio Lighthouse Cases), "In seven years of art school I didn't learn how to sculpt, I didn't learn how to work with a computer, I didn't learn how to work with fibreglass, but I had this fantastic teacher who taught me to talk about my work, to think about my work, to develop my own language."(*ref9*). If all educators inculcated this line of thought, a student would be well equipped to face invasions by AI and crisis like pandemics. Interdisciplinary education could be an introduction to allied subjects of ID like set design, lighting, product design, traditional craft knowledge etc. Introduction of interdisciplinary education acts as a strong base for students to respond to and withstand major disruptions. These connections with the basic arts and alternatives from various fields will instil confidence in the students. The ability to adjust, change and move ahead will be a core value embedded in the students at a very young stage, as an ongoing process rather than a one-off response. In our current education system, Essalih, Ourahay & Khzami, (2022), all indicate that students are given minimal opportunities to take initiative; instead, they are mainly expected to follow a predetermined sequence of steps or actions in a specific order, often without prior reflection or a clear understanding of the process. Additionally, it seems that teachers may not fully grasp the importance of fostering critical thinking in their students. Educators' roles in teaching critical thinking is vital in cultivating these skills among students. Thus, their understanding and how it is implemented in the classroom is valuable to be investigated to provide appropriate recommendations to increase the ability of this skill among students (*ref4*).

Integrating critical thinking with resilience in interior design education can bring a much-needed renewal to the learning process. Together, critical thinking, interdisciplinary education and resilient skills will empower students to adapt, innovate, and engage confidently to real-world design challenges.

RESEARCH METHODOLOGY

Flexible Design thinking (FDT)

The current framework of the education system is rigid and, in this paper, we recommend an evolved configuration of the same - Flexible Design Thinking (FDT). FDT blends agility, interdisciplinarity, situated practice and reflexive pedagogy to create resilient educational ecosystems. The curriculum defined by the statutory and regulatory bodies must serve as a guide in line for setting

the end goal. There should be flexibility for the educators to pave their own pathway to achieve the end results. The network hubs-faculty could try to infuse pop up studios, guest lectures and arrange for interior site visits (places where interior renovation work is ongoing). Not all students enrolled under a programme have the same IQ, background, enthusiasm or ability to understand a set type of teaching methodology. The educators have to break it down as per the capability of the student. FDT should be conceptualized as a pedagogical stance and curriculum design principle that enables rapid reconfiguration of learning goals, methods, and partnerships without sacrificing disciplinary integrity. Mentors function as vital social networks hubs within pedagogy, shaping how students learn, grow and see themselves as future professionals. For this role to be effective, mentors must understand the individual gaps, struggles, and strengths of each student. These mentors should be designated to support students throughout their entire academic journey, guiding them clearly through each stage along the way. For instance, a Bachelor of Vocation in Interior Design is a three-year programme conducted under the University of Mumbai, India. This is a skill-based degree. The students must be job-ready (resilient) once they graduate successfully. The curriculum (physical) structure and examination framework are predetermined (*ref6*). Within such a system, students who require additional support, can be identified early -this entails assigning mentors to each student for the full duration of the three-year programme. Each mentor (acts as the start of the network hub) can then work with a diverse group of senior and junior students who share comparable challenges and can relate to one another. This structure nurtures peer-to-peer learning, builds confidence to acknowledge limitations, and strengthens students' sense of belonging and professional identity.

As per *Ref7*, in interior design education, students often address open-ended interior design problems for existing buildings using hand sketches and digital renderings, usually based on hypothetical clients. As a result, despite producing visually appealing and code-compliant solutions, they rarely engage real case scenarios, which leads to disparity between them as the "Interior Designers" and the needs of the client. The curriculum structure also limits the students' ability to anticipate real-world challenges. In addition to this, the advent of AI tools like RoomGPT (*ref8*), makes it very easy for a student to provide generative images without actually manually drafting. This creates a gap in the technical understanding for the students. As shared in *Ref2*, interior design online classes conducted during COVID 2019 affected students differently, depending on their age groups. It is interesting to note the behavior pattern shown by different age groups to isolated learning. Each group experienced unique challenges and outcomes in adapting to digital learning. An interview was conducted with the Principal of a leading college of Architecture and Interior Design, as a part of a case study, to understand the problems faced during pandemic, solutions offered and AI intrusion/inclusion (*Appendix*). The answers to the questionnaire to the Principal highlights how the Interior

Design department responded to the COVID-19 pandemic with adaptability, sensitivity, and strong institutional support. Clear and timely communication through multiple channels helped faculty, staff and students remain informed and reassured during a period of uncertainty. From the outset, the department prioritized health, safety and emotional well-being, while ensuring that academic continuity was maintained. The rapid transition to online platforms such as Google Meet and Google Classroom enabled uninterrupted teaching, studio interactions and project guidance. Faculty and administrative staff were upskilled to manage digital tools effectively, while flexible policies for attendance, submissions and assessments acknowledged the varied technological and personal challenges faced by students. These measures ensured inclusivity and allowed learning to continue without compromising fairness or academic standards. Adaptations in studio teaching, juries, and evaluations demonstrated that even practice-based design education could be meaningfully supported through digital modes when required. Strong management and governance support further strengthened the department's response. Investments in digital infrastructure, cloud-based data management, and structured assessment systems enabled smooth coordination and transparency. At the same time, phased campus reopening with strict safety protocols reinforced the institution's commitment to community health. The facilitation of vaccination access for students and staff was a significant step in building confidence and enabling a gradual return to physical learning environments. The pandemic experience also offered valuable insights for the future of design education. While online and hybrid modes proved effective for continuity, the importance of hands-on studio work, site visits, workshops and one-to-one mentoring became even more evident. In the post-pandemic context, with the growing influence of AI, the department's emphasis on in-class engagement, process-based evaluation and academic integrity reaffirms the central role of human creativity and critical thinking. Overall, the pandemic acted as a catalyst for positive transformation, resulting in a more flexible, resilient and balanced model of Interior Design education that integrates digital tools while preserving the essence of experiential learning and mentorship. A few common suggestions that can be highlighted through the references (attached towards the end) is that the social network (faculty) serves as a carrier of authenticity: trusted advice, tacit knowledge, ethical reasoning, and resilience-promoting practices. It is essential to identify the main tools and technologies used currently, those that can be made redundant and those that could be used in the future. These technologies should be easily available and accessible to the end users. Before implementation of these technologies the obstacles that might arise must be identified, possible solutions debated and comprehended. While discussing the best solutions/alternatives all the stakeholders should be included. These healthy discussions might highlight the new opportunities that technologies offer. The attachment (*ref5*), by Dylan -Drone Industry expert, shows

us the use of drones and AI to map an existing tower and the interiors within. The drone with the multi-camera setup was used to capture the minutest details of both - exteriors and interiors of this tower. The data is used to generate a 3D model using software like Rhino, Photoshop etc. If students have access to this data/ information, to improve their work (both broaden and dive deeper), they could create life-like miniature models using 3d printers. This will unleash the capability for the students to feel and visualize the physical intricacies of the structure(s) at hand. The presence of a scaled model helps students grasp spatial and structural details more effectively through hands-on interaction. Students can further build upon this digital data by applying skills learned from craftsmen and artisans (hands on experience infused in the curriculum) to develop and fill the (traditional crafts) voids, and further refine exterior and interior surfaces. Integrating traditional craft practices in this way not only enriches the design but also helps revive the historical essence of the structure, while preserving its symbolic importance. The social media post further bolsters our hypothesis that tasks that were once repetitive and time-consuming for humans can now be completed within seconds at the click of a button with the help of tools available at our disposal. This emphasizes the fact that AI and digital technologies have significantly reshaped ways of thinking, saved on time and labour, kept the students engaged with traditional arts and crafts, expanded the scope of work, and transformed final design outcomes.

FINDINGS/ANALYSIS & INFERENCES

Based on the findings of this paper, it becomes evident that it is necessary to outline various pathways for the successful integration of digital technologies within the educational sector, to share knowledge through practical and in person experiences, to have strong network hubs-faculty and a curriculum which is flexible and allows/absorbs change. The following three can be suggested to function as core pillars to build a resilient urban educational system:

- Hands-on Voids-Fillers: Traditional crafts (e.g., weaving, woodworking) build tacit knowledge AI can't replicate (Polanyi, 1966). Site visits of ongoing Interior renovation projects.
- Faculty as Social Networks/Hubs: Mentors provide "authenticity nodes" via relational pedagogy.
- Interdisciplinary education: crucial bridge for linking design, urbanism, AI ethics.
- To make the foundation for the core pillars strong, a curriculum which can evolve and adapt is recommended. The flexible design thinking (FDT) suggests the following shift from the rigid to an improvised version of curriculum

Example table:

Traditional Element	FDT Adaptation	Resilience Benefit
Fixed Syllabus	Modular Modules as per need. POP-up studios. Frequent Interactions with industry professionals. Learning joint sessions with peers and seniors.	Adapts to shocks (e.g. remote learning, gears up for professional challenges)
Digital Tools	Software+ AI + Craft: Hybrids. Workshops with craftsmen. Application of interdisciplinary education with options of change in course.	Fills experiential voids, helps to save time and labour, focus on developing crafts
Solo Projects	Mentored Cohorts	Builds social resilience

A Suggested Blueprint for Institutional Survival Practical Roadmap:

- **Infrastructure Audit:** Educational institutions act as interconnected “nodes,” while their academic infrastructure - studios, classrooms, lecture halls, libraries and common spaces - forms the larger network. These spaces should be designed with flexibility in mind, allowing them to adapt, be reassigned and realigned, according to changing needs and situations.
- **Curriculum Retrofit:** The curriculum must remain adaptable and open to revisions on an annual basis. A balanced structure could include 40% core traditional subjects, 30% hands-on craft-based learning and experiential practices, 20% AI and technology-driven learning and 10% mentored interdisciplinary projects.
- **Faculty Empowerment:** Educators-network hubs must have continuous upskilling and must be evaluated based on their ability to stay up-to-date on industry and academia research. Institutions should organize focused faculty development programs and training initiatives, particularly in facilitating FDT models. Collaborative mentoring with peers can be encouraged and supported through incentives.
- **Metrics for Resilience:** The effectiveness of the FDT model can be evaluated by tracking alumni progress and outcomes. Regular feedback sessions and engagement forums should be conducted to gain insights into the real impact and long-term success of these initiatives.

CONCLUSION

The study through this paper highlights the urgent need for ID education to evolve in response to rapid technological shifts, global uncertainties and changing learning expectations. The findings across literature review, empirical studies and case-based applications demonstrate that smart teaching systems powered by big

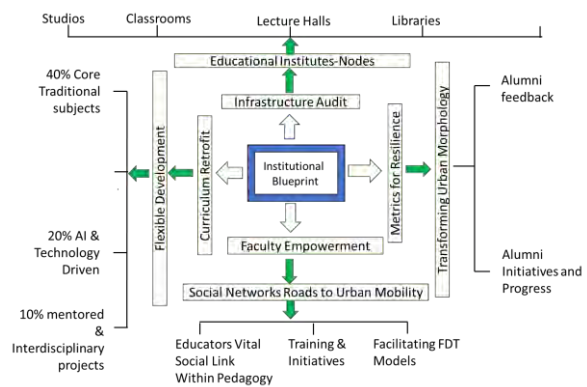


Fig 1: A suggested Institutional Blueprint for reference only

data can significantly enhance learning outcomes, engagement and personalization. At the same time, the research underscores that technology alone cannot sustain meaningful design education. FDT emerges as a critical framework that allows institutions to move beyond rigid, linear pedagogies toward adaptive and resilient learning networks. Within the educational framework, faculty members emerge as vital social networks or hubs in pedagogy, facilitating connections across students, disciplines and institutional silos. Their role extends beyond content delivery to mentoring, guiding and negotiating the informal spaces of learning - much like the everyday improvisations that arise around urban infrastructures. These pedagogical networks become especially powerful when supported by an interdisciplinary structure and a flexible curriculum, allowing education to respond dynamically rather than remain rigid and exclusionary.

Furthermore, the tension between traditional craft practices and the voids created by modernization mirrors the gaps left by large-scale urban infrastructures. Educational institutions are uniquely positioned to bridge these voids by integrating craft knowledge with contemporary design thinking, technology and research. When embedded within the academic framework, traditional crafts are not relegated to the margins but become living systems of knowledge that foster resilience, cultural continuity, and innovation. Ultimately, reimagining educational institutions as adaptive nodes—supported by robust academic infrastructure, socially connected faculty networks, interdisciplinary collaboration and respect for traditional knowledge - offers a pathway toward more equitable and resilient futures. Much like cities, education systems must learn to accommodate flux, negotiate access and cultivate meaningful connections, ensuring that no learner, discipline or form of knowledge is left behind in the shadows of progress.

APPENDIX

- Questionnaire for the Principal/ HOD -Covid Pandemic 2019
- How was the news of the pandemic communicated to the Interior Design Department and your team?
- What immediate actions and measures were taken by the department at the onset of the pandemic to support both faculty and students during the

transition (e.g., studio access, project guidance, mental health)?

- What software or platforms were used to conduct classes and studio critiques (e.g., CAD, BIM, 3D visualization, virtual pin-ups, LMS)?
- Were special permissions or flexibilities granted to faculty and students (e.g., studio access, submission formats, project milestones, attendance policies)? If so, what options were available?
- What governance or management support infrastructure was in place to sustain operations (e.g., design studio schedules, cross-department coordination, resource allocation)?
- Was the Interior Design program equipped to handle the changes brought on by the pandemic (e.g., studio closures, remote critiques, material sourcing)?
- How were academic continuity and assessment adapted for design studio courses (e.g., studio critiques, juries, juried reviews, project deadlines, grading criteria) during the pandemic?
- What training or upskilling opportunities were provided to faculty for delivering online or hybrid design instruction (e.g., virtual studio workflows, digital fabrication demonstrations, remote critique practices)?
- How did the department address digital access and material/ fabrication tool access disparities among students (e.g., software licenses, hardware, access to maker spaces, hardware loans, remote access to CAD/CAM tools)?
- What safety protocols and health measures were adopted for any on-campus studio activities or workshop sessions, and how were they implemented in a limited or phased reopening?
- How did you measure the effectiveness of the department's response (KPIs, student and faculty feedback, project outcomes, portfolio quality), and what lessons informed future planning for design education?
- Which is the outcome of the entire Covid pandemic which you consider positive and incorporate in the institution and education?
- With the strong influx of AI post-pandemic, what hands-on experience have you incorporated for the students in the curriculum to minimize the influence of AI.

REFERENCES

- *25th International Conference On Engineering And Product Design Education: 7-8 September 2023, Elisava University School Of Design And Engineering, Barcelona, Spain Educating Resilient And Well Designers.*
- *Rebecca PRICE and Mieke van der BIJL-BROUWER*
- *Delft University of Technology, Faculty of Industrial Design Engineering, The Netherlands*
- *The Impact of COVID-19 Lockdown on Design Students' Performance Case Study in the UAE:*
- *Dana Khalid Amro.*
- *Design Pedagogy in an Uncertain World: Sensible, Transdisciplinary, and Post-Human Approaches Cecilia De Marinis, Jaron Rowan.*
- *Integration of Critical Thinking in Interior Design Education: Investigating the Educators' Perception and Challenges.*
- *Norhayati Kassim and Zulkarnain Hazim*
- *Interior Design Program, Department of Built Environment Studies and Technology, College of Built Environment, Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus,*
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- *Board of Studies, Bachelor Of Vocation (Interior Design), University of Mumbai.*
- *Pedagogy + Reflection: A Problem-Based Learning Case In Interior Design Abimbola O. Asojo & Hoa Vo, University Of Minnesota- International Journals For Design And Learning, 2021, Volume 12, Issue 2.*
- *RoomGPT*
- *A Study On The Integration Of Digital Design And Fabrication Technologies In The European Craft Sector- Understanding The New Technological Context For Craftsmanship.*