# Design.IO: Teaching Design System through Interactive Learning & LXD Integration

A PROJECT REPORT

SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE
OF

MASTER
OF
DESIGN IN
**VISUAL DESIGN**

Submitted by

**Rakshit Arya (2K23/MDVC/07)**

Under the supervision of

ASST. PROF. NEERAJ RATHEE



**DEPARTMENT OF DESIGN**

DELHI TECHNOLOGICAL UNIVERSITY

(Formerly Delhi College of
Engineering) Bawana Road,
Delhi 110042
**April, 2025**

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## CANDIDATE DECLARATION

In partial fulfillment of the requirements for the award of the Master of Design degree, I, **Rakshit Arya**, Roll No.-**2K22/MDVC/07**, student of M.Des (Visual Design), hereby declare that the project dissertation, **"Design.IO: Teaching Design System through Interactive Learning & LXD Integration**," which I submitted to the Department of Design, Delhi Technological University, Delhi, is original and has not been copied from any source without proper citation. This work has not previously formed the basis for the award of any degree, diploma, associateship, fellowship, or other similar title or recognition.

Place: Dwarka, Delhi

**Rakshit Arya**

Date: 12.05.2024

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Delhi-110042

## CERTIFICATE

I hereby certify that the Project Dissertation titled "**Design.IO: Teaching Design System through Interactive Learning & LXD Integration**" which is submitted by **Rakshit Arya**, Roll No: **2K23/MDVC/07**, Department of Design ,Delhi Technological University, Delhi, in partial fulfilment of the requirement for the award of the degree of Master of Design, is a record of the project work carried out by the student under my supervision. To the best of my knowledge this work has not been submitted in part or full for any Degree or Diploma to this University or elsewhere.

Place: Dwarka, Delhi

**Asst. Prof.**
**Neeraj Rathee**

Date: 12.05.2024

**SUPERVISER**

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Without the collective support of all three mentors, this project would not have reached its current form.

Place: Dwarka, Delhi

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Dr. Jyoti Kumar
Professor

Date: 24-12-2024

### Internship Offer for Rakshit Arya

Dear Rakshit,

I am pleased to confirm your internship at the Divine Lab, Department of Design Indian Institute of Technology Delhi (IIT, Delhi).

You will be working as a UI/UX design intern on the curriculum development of the Digital Design and Development course at the Schools of Applied Learning in Punjab.

The internship is scheduled to begin on December 16th, 2024, and will be a 2-month-long opportunity, ending on February 16th, 2025.

If you have any questions, please feel free to contact me.

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**Internship Offer for Rakshit Arya**

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You will be working as a UI/UX design intern on the curriculum development of the Digital Design and Development course at the Schools of Applied Learning in Punjab.

The internship is scheduled to begin on February 17th, 2025, and will be a 2-month-long opportunity, ending on April 25th, 2025.

If you have any questions, please feel free to contact me.

Prof. Jyoti Kumar

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# Abstract

This research project explores the design and development of *Design.IO*, an interactive e-learning platform aimed at enhancing the teaching of UI design systems through the integration of Learning Experience Design (LXD), gamification, and user-centred methodologies. Responding to the limitations of conventional online design education—such as passive content delivery, low interactivity, and a lack of real-world application—the platform introduces a hands-on, practice-driven approach aligned with the pedagogical goals of NEP 2020.

The study employs a mixed-methods framework combining literature review, competitive analysis, surveys, and semi-structured interviews with learners and educators to uncover user needs and learning behaviours. Insights gathered informed the development of learner personas, journey maps, and an interactive curriculum grounded in instructional design models like ADDIE, Project-Based Learning, and Cognitive Load Theory. A high-fidelity prototype was developed in Figma, featuring gamified modules, progress tracking, real-world design challenges, and adaptive learning paths.

Usability testing with secondary school students validated the platform's effectiveness in promoting engagement, comprehension, and application of design principles. The findings advocate for a paradigm shift in digital design education—one that prioritises experiential learning, accessibility, and UX-driven instruction. *Design.IO* serves as a scalable model for teaching complex design concepts in an inclusive, interactive, and learner-centric manner.

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# 1. Introduction

## 1.1 About the Company

This dissertation project was carried out under the guidance of the Design and Innovation in Villagepreneurs' Indigenous Network Ecosystem (DIVINE) Lab, inaugurated on 28th December 2020. The DIVINE Lab, funded by the Common Service Centers (CSC) initiative, acts as a collaborative platform where students and entrepreneurs collectively address challenges and opportunities at the village level. It is situated within the Department of Design at the Indian Institute of Technology (IIT) Delhi.

Through this initiative, I had the opportunity to work under the mentorship of Professor Jyoti Kumar, Head of the Department of Design at IIT Delhi. The Department is well known for its multidisciplinary research and dedication to creative projects that combine design, technology, and social relevance. As part of one of India's leading institutions, the department provides an environment that supports academic diligence and real-world application.

The department houses several specialist labs that support varied research and student development, including the User Experience Lab, Makerspace, Human Factors and Ergonomics Lab, QuEST Lab, and the DIVINE Lab.

The mission of the DIVINE Lab and the Department of Design strongly aligns with the objectives of this dissertation exploring equity and effectiveness in digital design education through the lens of user experience.

## 1.2 Project Brief

This project aims to design an e-learning platform focused on delivering practical design knowledge, specifically in the area of design systems. By leveraging principles of UX design and educational psychology, the platform seeks to enhance student engagement and understanding of UI design.

The final deliverable will be a validated prototype of a digital learning tool intended to teach design systems through an engaging, practice-based approach.

## 1.3 Overview

Historically, design education followed an apprenticeship model, where skills were passed down through hands-on mentorship. The founding of the Bauhaus School in the early 20th century marked a paradigm shift, merging fine and applied arts into a structured academic model (Meyer & Norman, 2021). That laid the groundwork for modern design education, evolving to embrace problem-solving, interdisciplinary thinking, and the integration of technology.
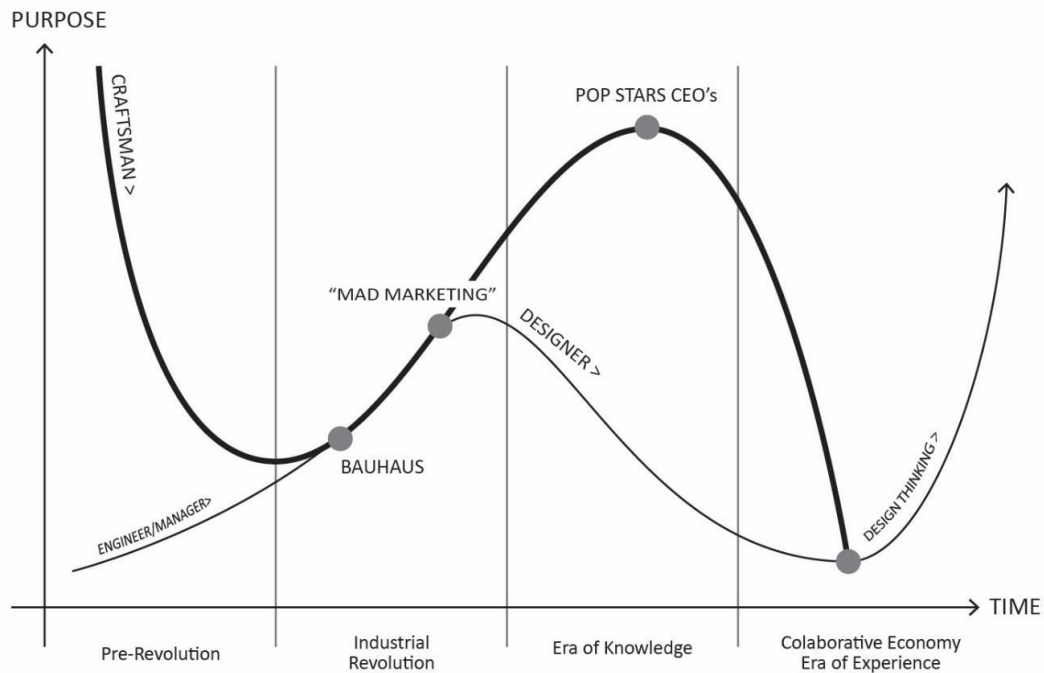
*Figure 1: The return of the design essence*

Today, the design field extends beyond physical products to include digital interfaces, virtual environments, and AI-powered experiences. With the digital era in full force, design education has rapidly adapted to meet the growing demand for expertise in UX/UI design, interaction design, and digital product development. Design education has become more accessible, flexible, and individualised thanks in large part to online platforms (Joshi, 2024).

Learner engagement has been demonstrated to rise in well-designed digital learning environments that incorporate UX/UI principles, such as gamification, interactivity, and simple navigation (Jain et al., 2024). However, digital learning also presents notable challenges, particularly in under-resourced areas where socio-economic barriers, limited digital literacy, and cognitive overload hinder effective participation. To overcome this, inclusive and accessible design strategies are essential, such as mobile-first platforms, low-bandwidth content, and adaptive learning systems that accommodate diverse learning needs.

Design education inherently involves iterative reflection, critique, and adaptability. The balance between theory and practice is key, fostering both creative thinking and analytical problem-solving. As industries increasingly depend on digital design to enhance user experience, there is an urgent need for design education that is industry-relevant, flexible, and accessible.

The integration of technology, pedagogy, and accessibility will define the future of design learning-equipping students to thrive in a constantly evolving digital world.
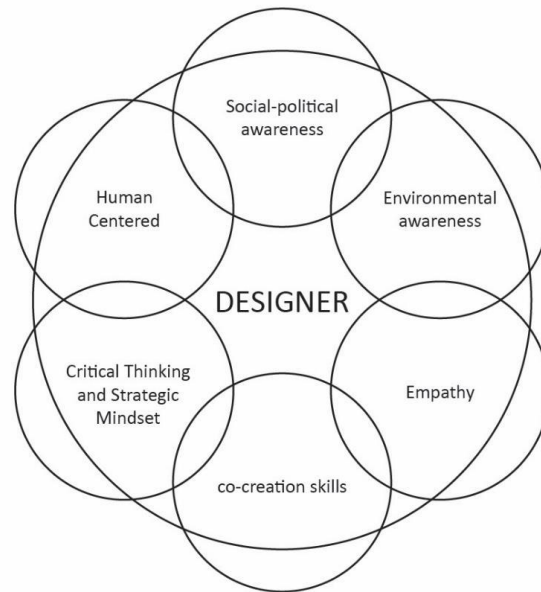
*Figure 2:New skills for the contemporary designer*

## Overview of Educational Technology in Design Learning

The field of educational technology (EdTech) has evolved significantly-from the introduction of radios in classrooms in the 1920s to the incorporation of AR/VR and AI today. Early tools like projectors and PCs in the 1930s and 1980s, respectively, increased classroom accessibility. By the 1990s, collaboration and information sharing had been transformed by the internet and interactive whiteboards (Boateng et al., 2024).
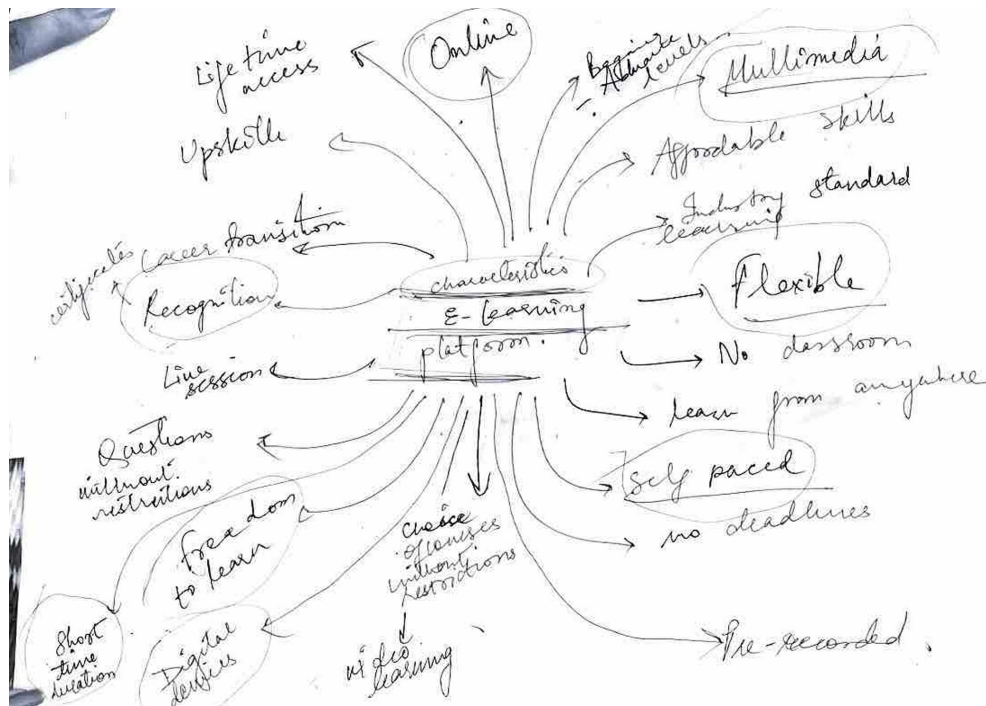


*Figure 3: Brainstorming to understand online learning*

The early 2000s marked the rise of online learning platforms that offered scalable and self-directed education, including foundational training in design principles (Timotheou et al., 2023). Today's digital learning environment offers both synchronous and asynchronous models. Content is delivered through videos, e-books, podcasts, AR/VR simulations, and gamified experiences-making education more flexible, affordable, and inclusive (IJCRT, 2024).

Nonetheless, design students face unique challenges-many platforms lack visual interactivity, real-time feedback, and active participation opportunities, all crucial for mastering UI design. The COVID-19 pandemic exposed these shortcomings, as traditional curricula struggled to transition online due to a lack of infrastructure and teacher training. Long virtual sessions often led to disengagement, and the lack of creative input restricted innovation. Additionally, high device costs and limited internet access have widened the digital divide in underserved areas (Kamat & Nasnodkar, 2024).

Poorly designed interfaces and content-heavy formats often result in cognitive overload, particularly in visually demanding subjects like design systems (Prasser, 2024). Teachers also report lacking the necessary training to integrate EdTech into design courses effectively.

To overcome these challenges, this study advocates a holistic integration of EdTech, solid instructional strategy, and learner-focused UX design. The upcoming sections examine how pedagogy, tools, and design thinking can converge to teach UI design more meaningfully in online environments.

Technology alone doesn't ensure successful learning; quality teaching, engagement, and interaction are vital (Kumar et al., 2022). For effective e-learning, both learners and educators must develop adequate digital skills and confidence.

Furthermore, new pedagogical questions arise: In what ways can learners be equipped to foster peer-to-peer learning effectively? How might AI-enabled personalised learning and social learning through small-group collaboration be combined to improve design mastery and creativity? These reflections highlight the importance of comprehensive instructional and gamified approaches that extend beyond simply delivering content, aiming instead to actively nurture learner motivation, engagement, and practical application (Sharples, 2019).

# 1.4 Background

This project is part of the DDD initiative, which stands for Digital Marketing, Digital Design, and Digital Development. It forms a component of a learning experience design project within the Digital Design and Development curriculum at the Government Senior Secondary School of Applied Learning in Punjab, aligned with the National Education Policy (NEP) 2020.

NEP 2020 encourages a comprehensive approach to education by highlighting 21st-century skills like digital fluency, creativity, critical thinking, teamwork, and flexibility (LearnQoch, 2024). It aims to integrate vocational training with academic curricula, closing the gap between classroom learning and industry-ready skills (Kaur, 2024).

Aligned with this vision, the project seeks to design scalable and engaging digital learning experiences focused on practical design education, making design skill-building more widely accessible.

## 1.5 Significance

As UI design becomes essential across various sectors from communication and product design to education, there is a growing need for digital platforms that teach these skills in practical, engaging ways. Current e-learning models often fall short, relying heavily on static videos or slide presentations and failing to teach hands-on design system skills effectively (McCarthy et al., 2022).

This project aims to bridge this gap by developing a learner-centred platform that integrates gamification with instructional design and user experience principles. It encourages active, experiential learning where users can practice, reflect, and apply UI design concepts in real time.

The significance of this work lies in its ability to give-self-learners, teachers, upskillers, and young professionals outside of formal institutions access to design education to democratise it.

- Bridge the theory-practice gap by enabling learners to engage with real-world design problems and tools and explain their relevance.

- Support NEP 2020 goals by promoting 21st-century skills through project-based, vocational learning.

- Contribute to Ed-tech innovation by presenting a prototype model that fuses learning experience design (LXD) with UX research for better engagement and impact.

By re-imagining how UI design and design system principles are taught online, this project supports the broader aim of creating scalable, inclusive, and effective creative education solutions.

## 1.6 Aim

The primary goal is to design, build, and assess an interactive e-learning platform that teaches UI design, with an emphasis on design systems, in a compelling, accessible, and application-driven format. By combining good pedagogy with UX principles, the platform will provide a learner-centred experience that promotes critical thinking, practical involvement, and significant skill development.

## 1.7 Research Questions

How can an interactive e-learning platform be designed to enhance learner engagement, comprehension, and application of practical design principles?

## 1.8 Objectives

- Assess the present landscape of online design education to identify existing challenges and potential areas for enhancing the overall learning experience.

- Investigate and establish essential UX factors that contribute to improved engagement, interactivity, and accessibility within digital learning platform

- Create and design an interactive educational experience that brings design principles to life in a more engaging, immersive, and impactful way for learners in a longer run

# 2. Literature Review

The rapid transformation of educational methods in the 21st century has been largely shaped by technological progress and the increasing need for learning experiences that are both flexible and accessible. In this evolving landscape, design education finds itself at a pivotal point—balancing its traditional roots in studio-based, hands-on learning with the new opportunities provided by digital platforms. Once grounded in apprenticeship and craftsmanship, design education has gradually evolved into a multidisciplinary field that blends creative thinking, analytical reasoning, and technical expertise to equip students for a wide range of professional roles. As society becomes more digitally connected, conventional approaches to design instruction are being reconsidered through the lens of online and blended learning models.

This literature review explores the present and future landscape of design education within the context of online learning. It places particular emphasis on the integration of digital learning techniques, instructional design frameworks, and innovative technologies. The review investigates how tools such as MOOCs and e-learning platforms aim to mirror or reimagine the collaborative nature of studio education while also tackling ongoing challenges like learner disengagement, high dropout rates, and limited interactivity. Drawing on foundational educational theories, it also examines how constructivist, experiential, and inquiry-led approaches are being tailored to suit digital learning environments.

Additionally, this review underscores innovative pedagogical practices such as gamification, adaptive learning systems, immersive technologies, and social learning frameworks—all of which are particularly relevant in the context of teaching UI design and design system principles. These approaches play a critical role in fostering visual thinking, iterative experimentation, and feedback-driven refinement—core elements in mastering contemporary design practices. By integrating insights from instructional theory, learning experience design, and emerging digital tools, this literature review builds a comprehensive foundation for designing and delivering interactive, engaging, and effective online learning experiences tailored to the evolving needs of design education

## 2.1 The Evolution of Design Education and the Role of Digital Learning

The evolution of education in the 21st century has been marked by the integration of digital technologies and a demand for more accessible, learner-centred experiences. In design education, this evolution intersects with a legacy of hands-on, studio-based pedagogy that emphasises collaboration, iteration, and critique. Traditionally rooted in apprenticeship and craft, design education has become increasingly multidisciplinary, blending creativity, critical thinking, and technical skill to prepare learners for diverse professional contexts (Hall, 2016).
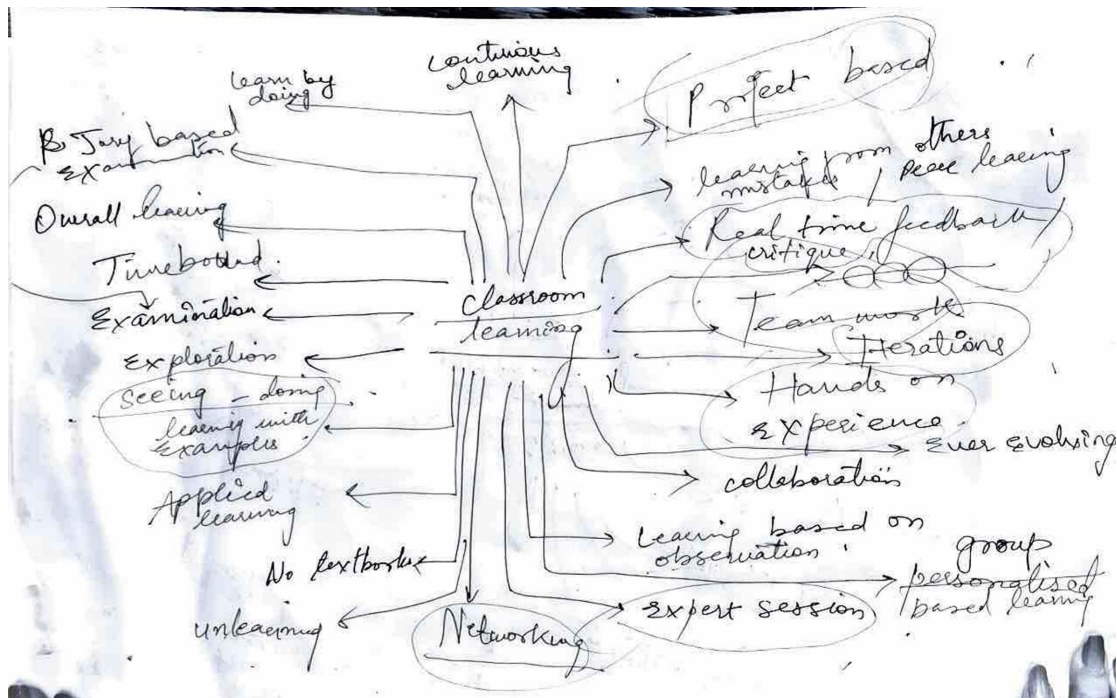
*Figure 4:Mind map created to understand  difference between online and classroom learning*

As society becomes more digitised, these pedagogical models are being adapted to online and hybrid environments. The COVID-19 pandemic further accelerated this transition, leading educators and institutions to rethink the structure, delivery, and engagement models of design learning. This review explores the implications of these shifts, focusing on gamification. interaction design, learning experience design (LXD), and the comparative effectiveness of online and offline learning.

# 2.2 Gamification in Online Learning

Gamification—the use of game elements such as points, levels, and rewards in non-game contexts—has gained traction as a method to boost engagement in digital learning environments. Handayani et al. (2020) argue that gamified platforms significantly improve UX/UI, which in turn maintains learner interest and reduces dropout rates. In visual design education, gamification encourages creativity, experimentation, and sustained focus through interactive, playful mechanisms.

However, research also warns against superficial implementations. For example, Hanus and Fox (2015) found that gamified students were less motivated when extrinsic rewards replaced intrinsic motivation. Similarly, the GamiFIN 2017 study (Mac Namara & Murphy, 2017) showed that while online learners responded positively to experience points, leaderboards had limited effectiveness—especially mid-to-late semester, when motivation tended to wane. This suggests the need for goal-orientated, context-sensitive design in gamified learning environments.

## 2.3 Interaction Design and the Social Dimension of Learning

Effective online learning relies heavily on well-crafted interaction design. As Wanstreet (2006) outlines, meaningful learning stems from three forms of interaction: learner-content, learner-instructor, and learner-learner. Platforms that foster these interactions—through forums, peer reviews, or collaborative projects—help replicate the community dynamics of traditional classrooms.

For design education, where critique and iteration are vital, these social affordances can simulate the studio model. Yet, poor implementation may lead to isolation and reduced motivation. The GamiFIN study noted that digital learners often struggled with a lack of social presence, even when engagement with gamified components was high.

## 2.4 Learning Experience Design vs. Instructional Design

Instructional Design (ID) and Learning Experience Design (LXD) are both pivotal to digital pedagogy but differ in emphasis. Traditional ID models like ADDIE offer systematic approaches to content development, focusing on outcomes and structured delivery (Abuhassna & Alnawajha, 2023). LXD, on the other hand, applies UX principles to learning design, emphasising empathy, emotion, and adaptability (Sousa & Martins, 2020).

In online design education, where learner diversity and creative exploration are critical, this fusion is particularly relevant. An effective LXD approach ensures learners are not only guided through content but are also emotionally and cognitively engaged throughout their journey.

## 2.4 Limitations of Online Learning Platforms

Despite advances in technology, digital learning environments continue to face challenges—especially in comparison with face-to-face education. Poor usability, one-size-fits-all content, and limited opportunities for spontaneous interaction often reduce learner satisfaction. Miya and Govender (2022) emphasise that inadequate UX/UI can diminish student attitudes toward e-learning, ultimately impacting academic performance.

The GamiFIN study (Mac Namara & Murphy, 2017) offers further insight: while online cohorts demonstrated higher learning outcomes via gamified experience points, offline cohorts showed declining performance and engagement, particularly with leaderboard mechanics. This points to delivery method as a significant factor in gamification's success.

Findings from Kaur et al. (2024) underscore these issues in a health sciences context. In a comparative study of 180 students, 77.77% of offline learners reported high satisfaction versus just 33.33% in the online group. Statistical analysis confirmed that

traditional learning yielded significantly better satisfaction and performance scores ($t = 32.88$, $p < .0001$). Students noted greater clarity, ease of communication, and focus in offline settings, supporting the argument that digital tools cannot fully replace the immersive, interactive quality of face-to-face learning.

## 2.5 Design Education and Emerging Online Innovations

To mitigate the limitations of online learning, educators are exploring adaptive learning, AI-powered feedback, and immersive technologies such as VR and AR. MOOCs and microlearning modules are being redesigned to integrate social features, inquiry-based tasks, and modularity—shifting from passive content delivery to active, participatory learning environments (Sharples, 2019).

Instructional models grounded in constructivism, connectivism, and cognitive load theory are also being applied to digital settings. These theoretical foundations ensure that learning environments are not only scalable but also responsive to learner needs—enabling creativity, collaboration, and critical engagement, which are core to design education.

## Conclusion

The transformation of design education through digital platforms presents both opportunities and challenges. While gamification and interaction design can enhance engagement and outcomes, these tools must be implemented with consideration of context, learner preference, and instructional integrity. Comparative studies confirm that while online platforms offer flexibility and access, they often fall short in fostering the holistic, interactive experiences that traditional models provide.

Instructional design frameworks, when integrated with UX-orientated strategies from LXD, offer a roadmap for overcoming these limitations. As design educators continue to navigate this evolving landscape, the goal must be to build learning environments that are inclusive, engaging, and reflective of the complex skills required in modern design practice.

# 3. Methodology

## 3.1 Overview

To investigate the role of design systems in enhancing UI design education in digital environments, this study employed a comprehensive, user-centred research methodology. Drawing from established principles in design research, educational inquiry, and learning experience design, the approach was structured to capture user needs, motivations, and behaviours within online learning contexts. A mixed-methods framework—combining qualitative insights with quantitative data—was selected to ensure both contextual depth and statistical validity (Abuhassna & Alnawajha, 2023; Sousa & Martins, 2020).

This methodology facilitated a dynamic interaction between research and design, promoting iterative exploration and informed decision-making. A revised Design Thinking model was adopted, incorporating a robust Research & Analysis phase to anchor the process in real user needs and pedagogical evidence (Sharples, 2019).

## 3.2 Research Approach

The research design integrated both secondary and primary methods to establish a theoretical and practical understanding of how design systems can be effectively taught online.

**Secondary Research**

The secondary phase included a literature review on gamification (Handayani et al., 2020), interaction design (Wanstreet, 2006), learning experience design (Sousa & Martins, 2020), and comparative education studies (Kaur et al., 2024). A competitor analysis and market study of digital learning platforms—such as Coursera, Udemy, UXcel, and NNG Group—was conducted to benchmark best practices in navigation, visual hierarchy, interactivity, and use of UI design systems.

**Primary Research**

Primary data were collected in two parts:

> Quantitative Survey: Distributed via academic networks and online design communities, this survey collected data on learners' experiences with digital platforms, familiarity with tools like Figma, and expectations from interactive learning environments.

> Semi-structured interviews: Conducted through video conferencing, interviews explored learners' personal journeys, challenges in understanding design systems, and insights into motivational factors for continued engagement.

This dual-phase approach ensured that research captured both macro-level trends and individual narratives to inform a user-centred design solution.

---

# 3.3 Methods and Tools

A variety of research tools were employed to support robust data collection and interpretation:

> Surveys: Included demographic questions, Likert scales, and design system familiarity prompts. Descriptive statistics were used to analyse learner behaviours and preferences over online learning, understanding their mental models.

> Semi-structured interviews: Enabled open-ended discussion, guided by a question bank yet flexible to allow for narrative depth. Transcripts were coded thematically using Braun and Clarke's (2006) methodology.

> Literature & Market Review: Included peer-reviewed EdTech white papers, UX case studies, and reports on learner engagement and gamification (Miya & Govender, 2022).

> Competitor Analysis: A detailed table was created to assess key features—responsiveness, design clarity, accessibility, and instructional interactivity—across selected platforms.

Together, these tools ensured data triangulation, increasing reliability and the richness of user insights.

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# 3.4 Data Analysis Strategy

A two-pronged analysis approach combined qualitative depth with visual data mapping:

> Affinity Mapping: Data from interviews were organised using digital whiteboards (e.g., Miro), grouping observations into themes such as "motivation through design clarity," "barriers in self-learning UI systems," and "need for peer-based interaction."

> Thematic Analysis: Using Braun and Clarke's (2006) six-step process, interview transcripts were coded, categorised, and developed into design personas and learning journey maps. This analysis revealed learners' cognitive patterns and emotional touchpoints in learning UI principles and design systems online.

---

# 3.5 Design Process Framework

The design process was structured around a revised Design Thinking framework tailored to UI and design systems education. It included:

- Research & Analysis: Grounded the problem space using literature reviews, user surveys, interviews, and competitor audits.

- Define: Synthesise findings into personas, empathy maps, and problem statements to clarify learner needs and contextual variables.

- Ideate: Used brainstorming, mind mapping, and concept clustering to explore instructional UI features—such as design tokens, layout rules, and interactive UI libraries.

- Prototype: Developed wireframes and mid-fidelity prototypes in Figma, emphasising responsive design systems, accessibility, and user flow clarity.

- Test: Conducted usability testing to evaluate navigation, consistency in UI design language, and task flow logic. Feedback loops supported design iteration and refinement.

This framework ensured that all decisions were grounded in user behaviour, educational usability, and best practices in digital design pedagogy.

## 3.6 Concept Generation and Prioritisation

Ideation and feature selection were conducted through a structured creative process:

Brainstorming & Mind Mapping: Generated diverse interface models and learning flows using tools like Excalidraw and Miro. Idea clusters focused on modular UI component learning, visual hierarchy, and interaction patterns.

Rapid Sketching: Enabled quick prototyping of screen flows, UI kits, and gamified assessment modules for iterative critique.

MoSCoW Prioritisation: Categorised features into must-haves (responsive layouts, feedback indicators), should-haves (progress bars, peer critique), and could-haves (gamification badges, level unlocks), based on user expectations and feasibility (Kaur et al., 2024).

This process ensured alignment between creative potential, pedagogical goals, and user-centred constraints.

# 4. Design Process

The project followed a structured, iterative methodology inspired by Design Thinking, adapted to digital pedagogy and the teaching of design systems in UI design. The process was anchored in Learning Experience Design (LXD) and educational theories such as cognitive load theory, project-based learning, and gamification (Sharples, 2019; Sousa & Martins, 2020). The following five phases: Discover, Define, Ideate, Prototype, and Test ensured user-centricity, pedagogical integrity, and actionable insight at every stage.
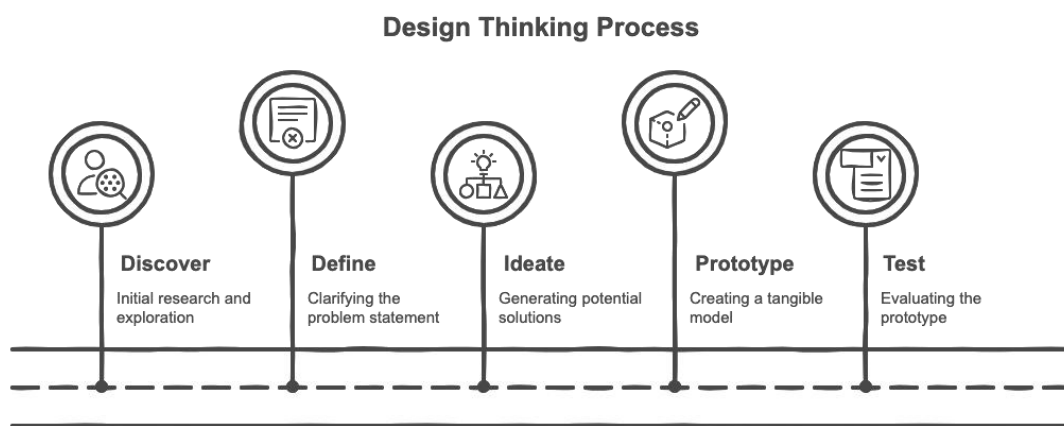


*Figure 5:Design thinking process followed*

## 4.1 Discover

The goal of this phase was to deeply understand how design systems, especially components like spacing, layout grids, tokens, and visual hierarchy, can be effectively taught through an interactive online platform. A **mixed-method and layered research approach** was adopted to ground the project in evidence and empathy.

### 4.1.1 Secondary Research

● **Literature Review**

An extensive review of scholarly and industry sources revealed key gaps in online design education. Following the literature review, key themes were further divided into three primary points, which were as follows:

     ✧     Blending tradition with technology in design education
     ✧     Gamification and interaction Design as engagement drivers

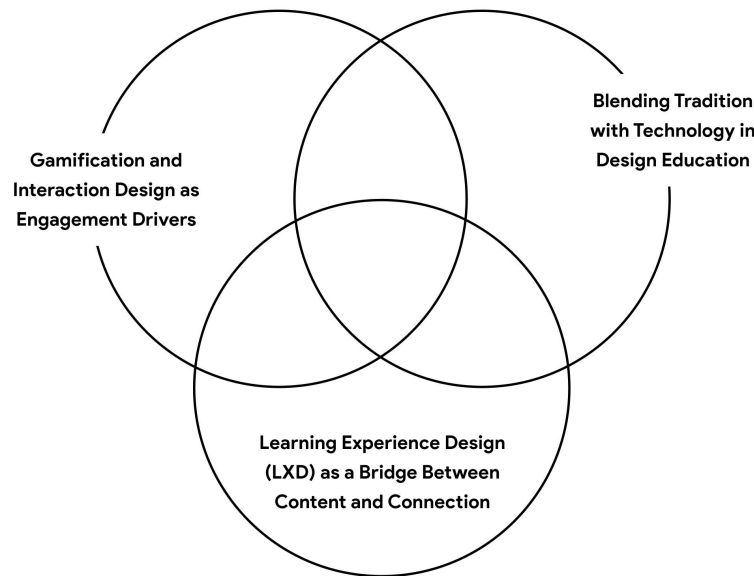◇     Learning Experience Design (LXD) as a bridge between content and connection



*Figure 6:Themes identified in literature review*

● **Competitive Analysis**

Online learning platforms like Coursera, Skillshare, UXcel, NNG Group, Udemy, and Interaction Design Foundation were evaluated using a custom rubric based on the following criteria. This rubric was developed by referencing well-established research in online design education, specifically the works of Mac Namara & Murphy (2017) and Sousa & Martins (2020).

**Content Modularity**: The degree to which courses are broken into manageable, sequential modules.

**Visual UI Structure**: The clarity, consistency, and aesthetic appeal of the platform's user interface.

**Peer Interaction Capabilities**: The availability and effectiveness of features that facilitate learner interaction and collaboration.

**Hands-on Learning Opportunities**: The extent to which platforms offer practical exercises, projects, or real-world applications.

**Feedback Mechanisms**: The presence of systems for providing learners with constructive feedback, either automated or instructor-led.

**Course Relevance to Design Systems**: The availability and depth of courses specifically focused on design systems.

•

Based on user feedback and reviews from various platforms, the following comparative analysis was compiled.

| Platforms | Content Modularity | Visual UI Structure | Peer Interaction | Hands-on Learning | Feedback Mechanisms | Design Systems Course Availability |
|-----------|-------------------|---------------------|------------------|-------------------|---------------------|-----------------------------------|
| Coursera | Structured courses with well-defined modules, weekly pacing, and progress tracking. | Professional | Moderate | Moderate | Instructor-led | Part of broader UI/UX courses, Includes modules on design systems within broader UI/UX design course |
| Skillshare | Bite-sized, project-based lessons ideal for quick skill development. | Creative | High | High | Peer feedback | Limited; embedded in UI design courses, Offers classes that touch upon design systems as part of UI design topics. |
| UXcel | bite sized courses with an option of skiping directly to assesment without goingg through theory | Modern & Gamified | Moderate | High | Automated assessments | Offers a comprehensive course on design systems, praised for its interactive and gamified approach. |
| Nielsen Norman Group | Structured courses with well-defined modules, live clases | Academic | Low | Low | Instructor-led | Provides in-depth workshops on design systems, though some users find them less accessible due to cost and time commitments. |
| Udemy | Course modularity varies by instructor; some highly structured, others linear or loose. | User-friendly | Low | Moderate | Instructor Q&A | Limited; Course coverage on design systems varies by instructor; some courses include relevant content within UI/UX curricula. |
| Interaction Design Foundation | Well structured and well defined courses with detailed foundation, focusing on basics | Structured | High | High | Peer-reviewed | Features courses specifically focused on design systems, with positive feedback on content quality and community engagement. |

*Table 1: comparative analysis of various platform*

These audits revealed that while several platforms offer content on design systems, there is a notable lack of hands-on, feedback-rich learning environments specifically tailored to this subject. Platforms like UXcel and Interaction Design Foundation are making strides in this area by providing dedicated courses with interactive elements and community support. However, the overall landscape indicates a need for more immersive and practical learning experiences that allow learners to apply design system principles in real-world contexts and receive meaningful feedback.

## 4.1.2 Primary Research
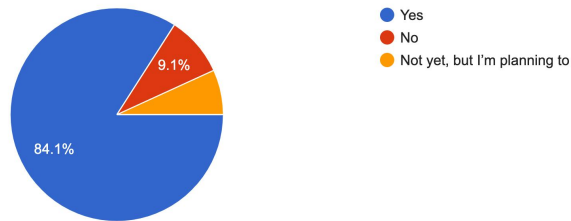
### User surveys

Google Forms was used to conduct a survey with over 40 respondents from diverse backgrounds to explore behaviours relevant to the research. The majority of participants were students (60%), reflecting the perspectives of younger, digitally native individuals. The remaining respondents included designers and professionals from the education sector teaching design, providing additional insight into how different learners engage with digital platforms and learning tools. This input helped uncover patterns in user expectations, learning preferences, and the professional relevance of design systems informing key decisions in content development, platform features, and user experience strategy.
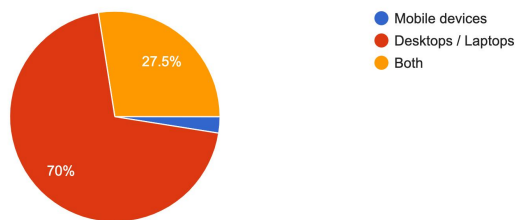
### Demographics

Age
44 responses



- Below 18
- 18 - 24
- 25 - 34
- 35 - 44
- 45 and above

43.2%

50%
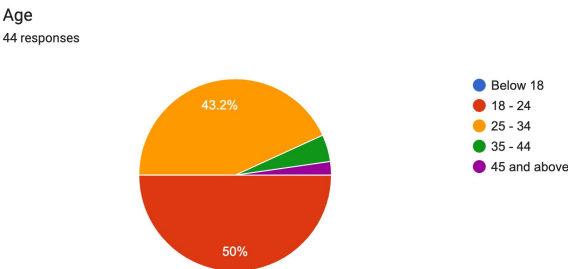
Have you enrolled in an online learning platform before?
44 responses



- Yes
- No
- Not yet, but I'm planning to

9.1%

84.1%

Do you prefer learning on mobile devices or desktops / laptops?
40 responses



- Mobile devices
- Desktops / Laptops
- Both

27.5%
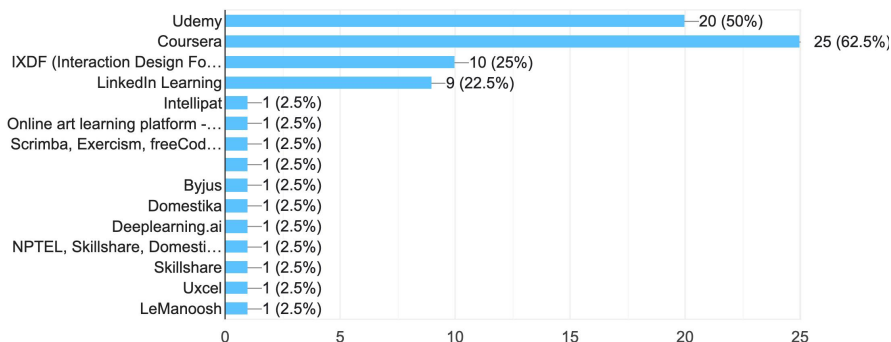
70%

### Demographic Analysis

- Approximately 60% of the respondents identified as students and the remaining 40% comprised professionals from the tech and education sectors, including designers and educators

- All respondents (100%) reported having enrolled in at least one online learning platform, highlighting the widespread adoption of digital learning environments.

- This shows that the survey attracted both foundational and advanced learners, offering a layered view of expectations from beginner to intermediate levels in UI design education.

- Most users (60%) preferred learning on desktops/laptops, suggesting a demand for screen space and functionality suitable for design tools, 20% used mobile devices, and 20% used both, highlighting the need for responsive, mobile-friendly platform design.

This demographic breakdown confirms that the primary user base for a digital design system learning platform includes young, academically engaged learners with growing exposure to professional tools and workflows.
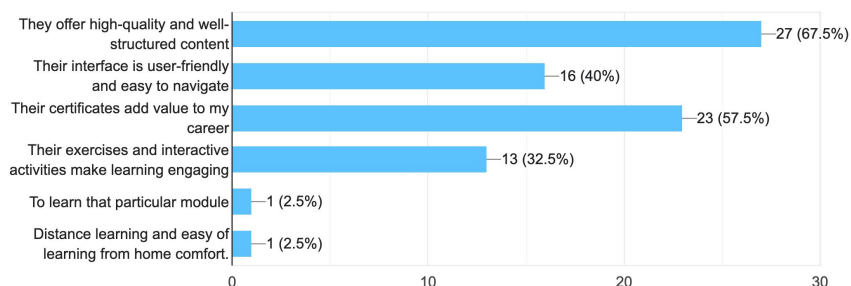
### Learning Experience

## Which online learning platforms have you used or plan to use? (select all that apply)
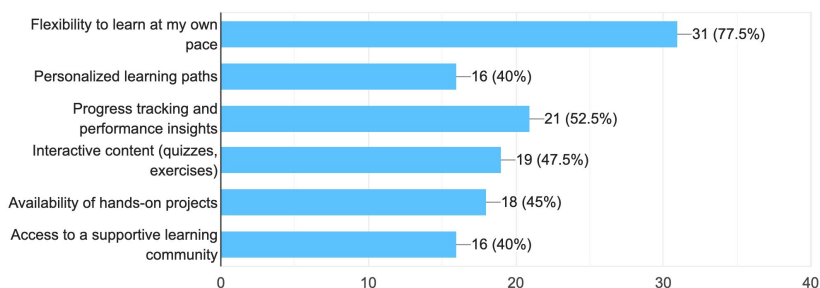40 responses

| Platform | Count |
|----------|-------|
| Udemy | 20 (50%) |
| Coursera | 25 (62.5%) |
| IXDF (Interaction Design Fo…) | 10 (25%) |
| LinkedIn Learning | 9 (22.5%) |
| Intellipat | 1 (2.5%) |
| Online art learning platform -… | 1 (2.5%) |
| Scrimba, Exercism, freeCod… | 1 (2.5%) |
| | 1 (2.5%) |
| Byjus | 1 (2.5%) |
| Domestika | 1 (2.5%) |
| Deeplearning.ai | 1 (2.5%) |
| NPTEL, Skillshare, Domesti… | 1 (2.5%) |
| Skillshare | 1 (2.5%) |
| Uxcel | 1 (2.5%) |
| LeManoosh | 1 (2.5%) |

## Why do you prefer these online learning platforms? (select all that apply)
40 responses

| Reason | Count |
|--------|-------|
| They offer high-quality and well-structured content | 27 (67.5%) |
| Their interface is user-friendly and easy to navigate | 16 (40%) |
| Their certificates add value to my career | 23 (57.5%) |
| Their exercises and interactive activities make learning engaging | 13 (32.5%) |
| To learn that particular module | 1 (2.5%) |
| Distance learning and easy of learning from home comfort. | 1 (2.5%) |

## What features matter the most to you in an online learning platform? (select all that apply)
40 responses

| Feature | Count |
|---------|-------|
| Flexibility to learn at my own pace | 31 (77.5%) |
| Personalized learning paths | 16 (40%) |
| Progress tracking and performance insights | 21 (52.5%) |
| Interactive content (quizzes, exercises) | 19 (47.5%) |
| Availability of hands-on projects | 18 (45%) |
| Access to a supportive learning community | 16 (40%) |

## Have you ever discontinued using a platform due to poor interaction design?
40 responses

- Yes — 40%
- No — 60%

18
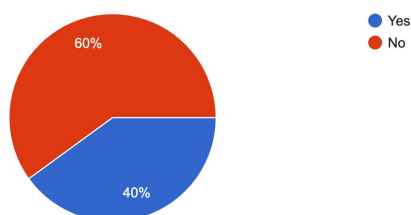
## Learning Experience Analysis

- Popular platforms such as Coursera and Udemy were used by 80% of participants, indicating a strong preference for structured, certificate-based learning environments.Interaction Design Foundation (40%), LinkedIn Learning (40%), and UXcel (20%) also showed notable traction-suggesting that learners are seeking both theoretical knowledge and skill-specific micro-learning.

- All 100% of users valued well-structured content, while 80% appreciated user-friendly interfaces. This reinforces the importance of modular, clear content delivery and intuitive navigation in any online learning solution.

- This Self-paced flexibility (100%), Progress tracking (80%), Hands-on projects and exercises (60%), Interactive content (70%), Personalised learning paths (40%). All are the findings that confirm the demand for platforms that are not only content-rich but also customisable, practical, and motivational.

The online learning experience analysis is that while access to digital learning platforms is widespread, the quality of engagement and interactivity often falls short of learner expectations.

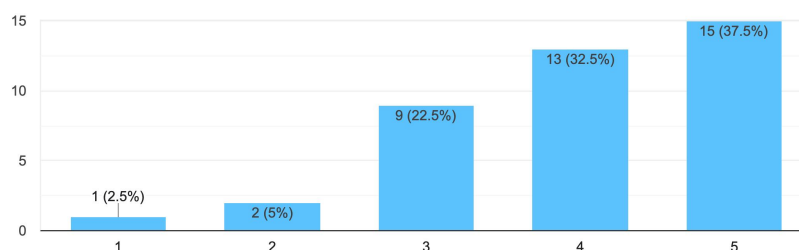## Interaction, Engagement, Behaviour, and Expectations

How effective do you find quizzes in reinforcing your learning on online platforms?
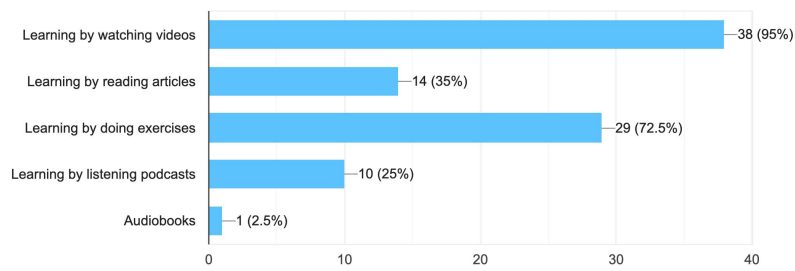40 responses
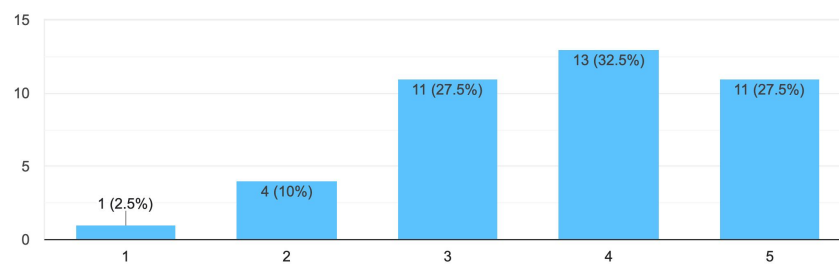


How useful are the hands-on exercises in helping you apply what you've learned?
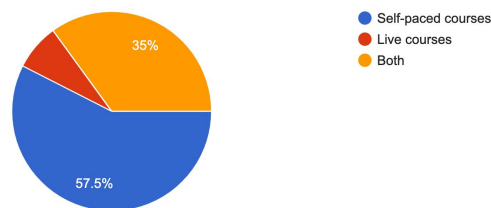40 responses

Which learning methods do you prefer? (select all that apply)
40 responses

| | |
|---|---|
| Learning by watching videos | 38 (95%) |
| Learning by reading articles | 14 (35%) |
| Learning by doing exercises | 29 (72.5%) |
| Learning by listening podcasts | 10 (25%) |
| Audiobooks | 1 (2.5%) |

Which types of courses do you prefer the most?
40 responses

- Self-paced courses
- Live courses
- Both

35%
57.5%

Which do you prioritise more in a learning platform – content quality or interface design?
40 responses

- Content quality
- Both are equally important
- Interface design

70%
30%
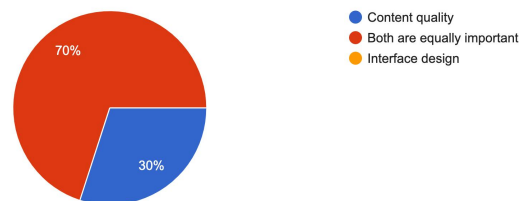
**Analysis: Interaction, Engagement, Behaviour, and Expectations**

- Most learners value seamless, intuitive interaction design in digital learning environments. 80% rated it as highly important, and 60% dropped courses due to poor UX. While features like discussion forums exist, they often lack depth or responsiveness, highlighting the need for real-time, meaningful interaction integrated directly into the learning flow.
- Learners are motivated by active engagement particularly hands-on exercises and interactive tasks. While 60% valued these features, inconsistent implementation limited their effectiveness. Gamified elements, progress tracking, and micro-interactions can significantly boost motivation, indicating that learning platforms must prioritise immersive, activity-based content over passive consumption to maintain consistent user engagement

- Users attract toward platforms offering both quality content and seamless usability. Preferences lean toward self-paced, flexible learning, with most users relying on desktops but a notable portion using mobile. Behavioral trends reveal that cluttered UIs, poor navigation, and lack of feedback disrupt learning.
.
- Modern learners expect a balance of instructional depth and user-friendly interface design. 80% consider both equally important. Expectations include hands-on application, personalised paths, real-world tools, and responsive design. Platforms that fail to deliver on these fronts risk disengagement. Users seek experiences that mirror actual design practice, not just theory delivery.

Learners demand interactive, engaging, and personalised learning environments that go beyond static content. Their behaviours are shaped by a desire for flexibility, clarity, and relevance, while their expectations centre on platforms that offer practical application, social collaboration, and user-centric design. These insights confirm the need for an educational platform. which is purpose-built to teach design systems in UI design through a rich blend of modular content, gamification, interaction design, and real-time feedback mechanisms.

### User interviews

To gain greater understanding beyond survey data, a set of one-on-one interviews was conducted with 8- 10 users, using tools like Google Meet, Otter, and Notion to support remote data collection to record data sets. both learners and mentors in the design field. The goal was to explore how users experience online learning, what challenges they face, and what they expect from a platform designed to teach UI concepts like Design System.

#### Interview Questions

- Could you start by telling me a little about yourself and your experience with online learning?
- *Which online learning platforms have you used or enjoyed the most, and what types of courses did you take on them?
- What factors influenced your choice of these platforms?*(For example, was it the content quality, ease of use, reputation, or something else?)
- What motivated you to pursue online learning instead of traditional, in-person classes?
- Can you describe any challenges you've faced while learning online and how you overcame them?
- Could you share a specific example of a course exercise or project that significantly enhanced your learning? How was it structured?
- How did the overall design of the platform such as its layout, ease of navigation, and accessibility affect your learning experience?
- How did interactive features like quizzes, gamification, or progress tracking impact your motivation and learning outcomes?
- How important is the quality of the course content in your decision to use an online platform?
- In your experience, how do peer interactions and instructor engagement influence your overall online learning experience?
- If you could change or add any feature to improve your online learning experience, what would that be, and why?*(Also, could you share a bit

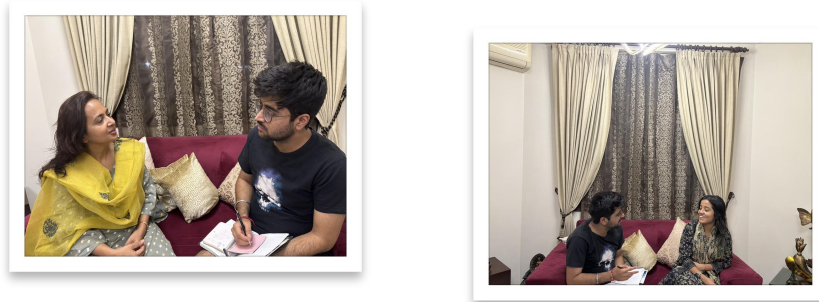about how you balance learning new content with applying what you've learned?)



*Figure 7: Interview conducted to Understand the experience of online learning*

The insights laid a strong foundation for defining learner needs and instructional challenges. To make it more clear there were different methods of analysis used

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# 4.2 Define

This phase focused on synthesising research findings to craft actionable insights and identify the core learning challenge. The aim was to translate abstract pain points into a structured problem definition by synthesising data through various activities

## 4.2.1 Affinity Mapping

The data collected from interviews and surveys was clustered to surface recurring patterns like "difficulty applying abstract concepts" and "need for feedback and guided practice." this mapping structure was used to structure.
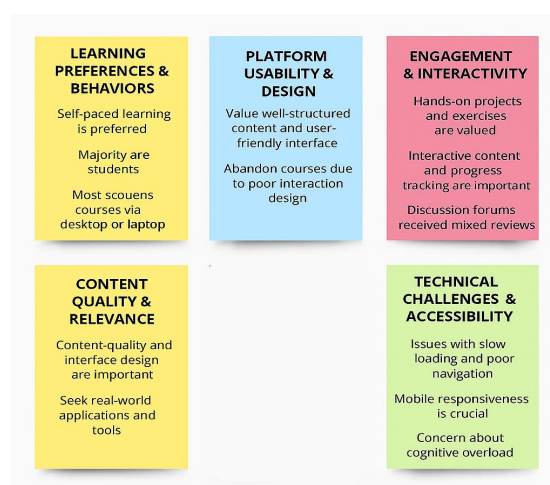


*Figure 8:Affinity map created to organise and structure user data*

## 4.2.2 Personas

Two primary learner personas were developed-*the Curious Beginner* (eager but overwhelmed) and *the Motivated Dropout* (intrinsically curious but discouraged by lack of feedback).



*"I enjoy learning design, but I often forget what I learn. I wish someone could actually show me how to use it, not just explain it."*

### Bio

Aanchal is a curious and imaginative 11th-grade student at a government school. She's recently discovered an interest in design through school activities and social media. Without access to formal design education, she relies on YouTube and free online content, though she often finds it hard to stay focused. Learns best visually and prefers hands-on practice over traditional lectures.

**Aanchal S**

School student interested in enhancing UI Design

Age/Gender
**16/Female**

Location
**Ludhiana, Punjab**

Occupation
**Class 11 Student**

Family Status
**Single**

**Technology Literacy**
Medium

### Goals

- Grasp the basics of design to prepare for entrance exams
- Learn color theory in an engaging and memorable way
- Create posters and digital artwork for school contests
- Grow her confidence in creative abilities

### Pains

- Loses interest in long, text-heavy lessons
- Struggles to apply concepts to real-world projects
- Has difficulty remembering terms like RGB or CMYK
- Lacks feedback—unsure if she's doing things correctly
- Feels demotivated when content is repetitive or unclear

*Figure 9:Persoan map of the Curious Beginner*



*"I don't just want to learn; I want to apply it too"*

### Bio

Arjun is a driven, ambitious, Design research professional who lives in a big city. He is always looking for ways to improve his skills and stay ahead of the competition. Enjoys socialising with friends and exploring places in free time. An individual who thrives in fast-paced environments. Enjoys staying up-to-date with industry news and developments.

**Arjun Mehta**

Computer Science graduate; interested in enhancing UI/UX skills

Age/Gender
**25/Male**

Location
**New Delhi, India**

Occupation
**Design Researcher**

Family Status
**Single**

**Platforms:**
Coursera, Udemy, IxDF

### Goals

- To stay motivated and engaged throughout the course duration.
- To apply theoretical concepts practically and get instant feedback.

### Pains

- Finds content boring and flat; prefers practical, hands-on learning.
- Difficulty navigating dashboards; lacks real-time feedback on progress.
- Cognitive overload from text-heavy courses without enough interactive elements.
- Visually engaging course layout, inspired by platforms like Duolingo motivates
- Have less time to contribute to a course due to hectic schedule

*Figure 10:Persona of Motivational Droupout*

### 4.2.3 Journey maps

Visualise a map of different phases across cognitive and emotional touch points for a beginner exploring design systems that were traced here, their path from initial curiosity to moments of frustration. Which was defined in a customer journey map.



# Customer Journey Map

### Discover

**Actions** Looks up "**design system** and UI design" on YouTube or or Google.

**Thoughts** I want to understand UI design properly.

**Feelings**
Curious and excited

### Start Learning

**Actions** (implicit) Beginning the learning journey with optimism.

**Thoughts** Analogous colors again? I'm not understanding this.

**Feelings**
Confused and disconnected

### Gets Stuck

**Actions** Rewinds videos, Googles confusing terms, skips ahead

**Thoughts** Frustrated Lack of feedback, unclear explanations, passive learnning experience

**Pain Points /Wins**
No visible progress no engaging elements to keep them interested

### Leaves the Course

**Actions** Closes the tab, shifts focus to art appisocial media

**Thoughts** (Feeling disconnected from the course

**Pain Points**
No visible progress tracking, no engaging elements to keep them interested

TAB CLOSED

*Figure 11:Customer Journey Map*

### 4.2.4 Problem Statement

**Based on synthesis, a refined *How Might We* (HMW) question was formulated:**

> *How might we create an engaging, interactive, personalised, and pedagogically sound digital platform to teach design systems in UI design in a way that aligns with real-world application and diverse learner needs?*

This statement informed all downstream design decisions, and to address the learning gap, the solution was structured using a blend of UX principles and instructional design models.

### 4.2.5 Models Identified

To make the effectiveness of the learning experience align with both educational and user-centred goals, multiple instructional design models and pedagogical frameworks were applied.

| Models | Why Was It Used? |
|---|---|
| Learning Experience Design (LXD) | Focused on learner-centred goals, emotions, and engaging UX to enhance online design education. |
| Project-Based Learning (PBL) | Enabled real-world, hands-on learning aligned with creative, iterative design processes. |
| How People Learn (HPL) | Structured learning with context, encouraging reflection and greater understanding. |
| Community of Inquiry (CoI) | Supported collaboration and peer feedback, simulating studio-like learning online. |
| ADDIE | Provided a clear, phased approach to designing and delivering effective digital learning content. |
| Constructivist & Inquiry-Based Approaches | Encouraged exploration, experimentation, and active learning in digital environments. |
| Cognitive Load Theory | Helped manage information delivery to avoid overload and support effective online learning. |

*Table 2:Models identifiaction table*

# 4.3 Ideate

The ideation phase generated and refined a range of possible solutions spanning both instructional strategies and UX interactions to address learner needs. This phase include deciding of curriculum, wire-framing and Hi-fidelity mockups with prototyping

## 4.3.1 Creative Exploration

- Brainstorming techniques were used in solo and group sessions to generate varied concepts.

- Mind maps helped cluster related features such as gamified learning zones, drag-and-drop challenges, and visual pattern recognition tasks. It helped to structure a framework to build a platform to teach design system
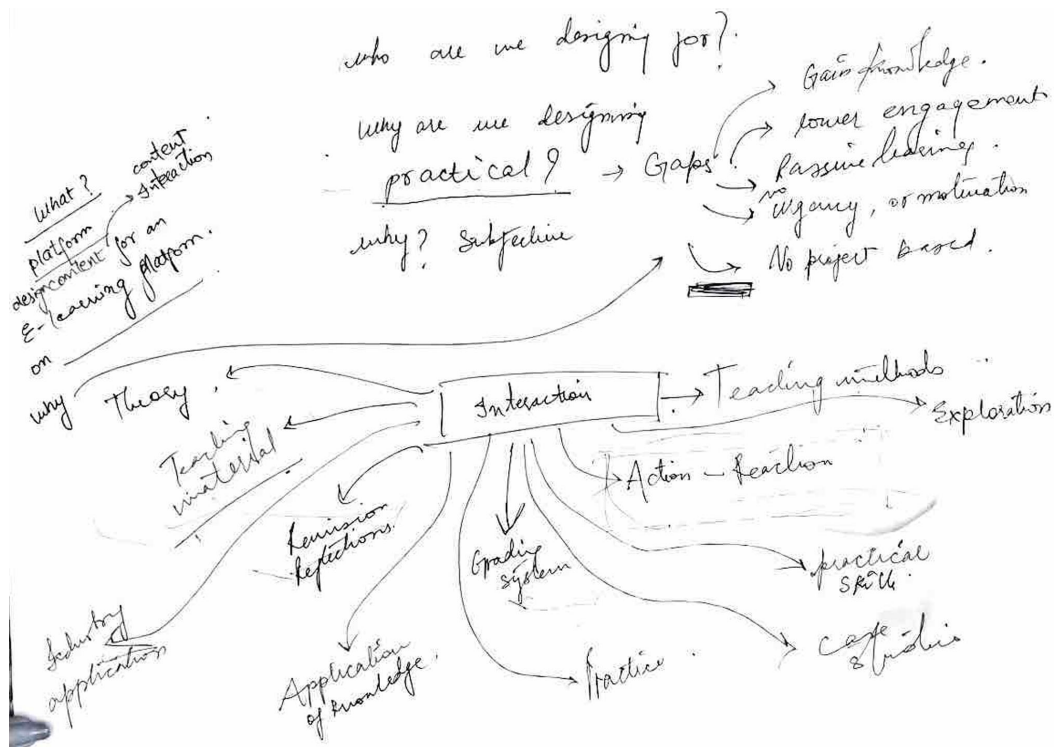


*Figure 12: Brainstorming done to identify the gaps and solutions*

## 4.3.2 Feature Priioritisation

To prioritise features we applied the Mos-cow prioritization framework, a method used to categorize features based on necessity, impact, and feasibility.

This approach helped align product decisions with real learner needs, research insights, and technical constraints. The matrix below outlines the Must-Have, Should-Have, Could-Have, and Won't-Have features for the initial product launch.
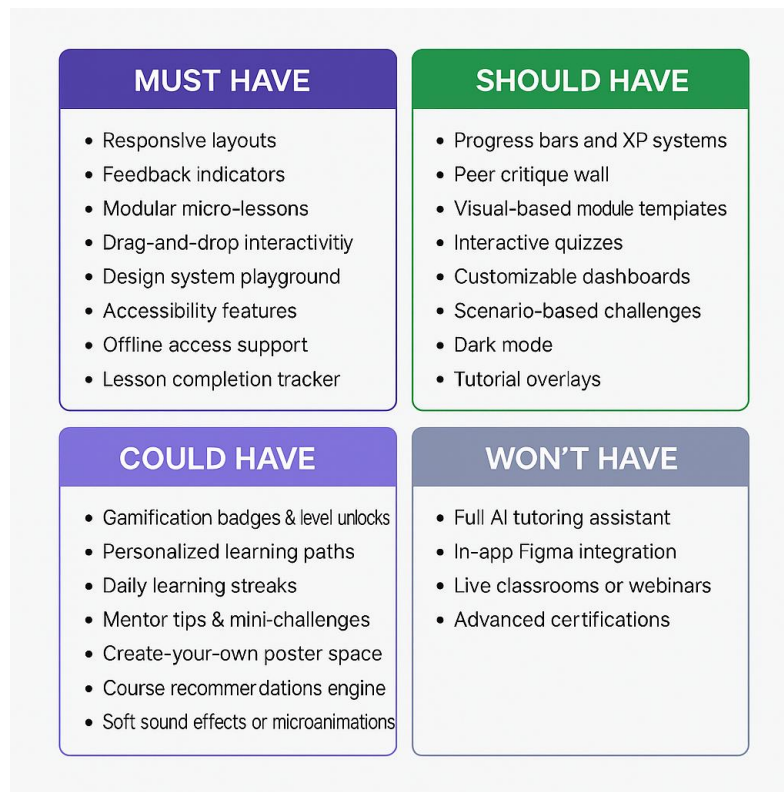


**MUST HAVE**
- Responsive layouts
- Feedback indicators
- Modular micro-lessons
- Drag-and-drop interactivitiy
- Design system playground
- Accessibility features
- Offline access support
- Lesson completion tracker

**SHOULD HAVE**
- Progress bars and XP systems
- Peer critique wall
- Visual-based module tempiates
- Interactive quizzes
- Customizable dashboards
- Scenario-based challenges
- Dark mode
- Tutorial overlays

**COULD HAVE**
- Gamification badges & level unlocks
- Personalized learning paths
- Daily learning streaks
- Mentor tips & mini-challenges
- Create-your-own poster space
- Course recommerdations engine
- Soft sound effects or microanimations

**WON'T HAVE**
- Full AI tutoring assistant
- In-app Figma integration
- Live classrooms or webinars
- Advanced certifications

*Figure 13: Mos–cow prioritization framework*

### 4.3.3 Learning Architecture

A  detailed curriculum was structured around key design system elements (e.g., design system elements, layout grids, spacing, and colour systems). Instructional strategies integrated problem-based learning, microlearning, and gamified feedback loops  was also included(Abuhassna & Alnawajha, 2023).

**Curriculam design : Mastering Design Systems**

The comprehensive course equips learners with the practical skills and knowledge needed to create, maintain, and scale effective design systems for digital products. With a blend of theoretical learning, practical activities, and real-world examples, it aims to help learners understand and apply design system principles in UI/UX design.

**Course Structure:**

- Theoretical Content: Text-based material with visual examples.

- Video Content: Short explainer videos to reinforce key concepts.

- Assessments: MCQs, type-in answers, and practical activities.

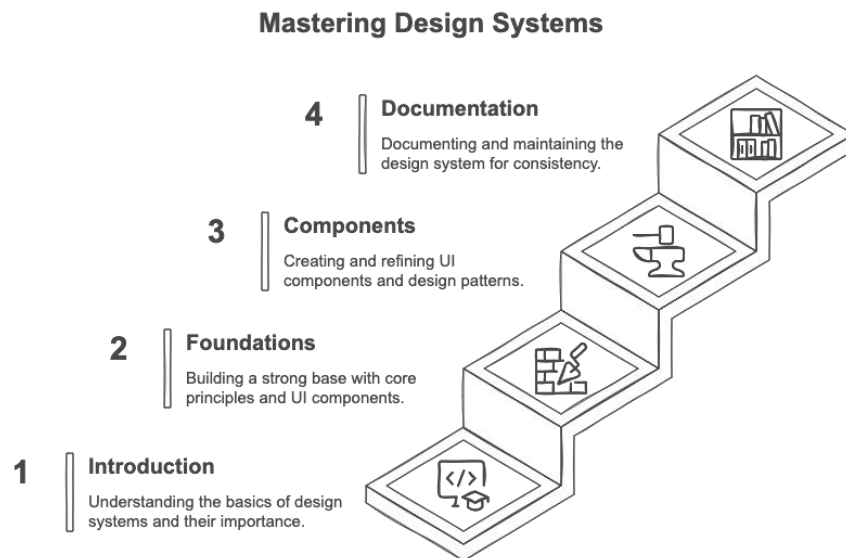- Project Submissions: Hands-on tasks with peer and instructor feedback.



*Figure 14:Curriculum framework defined*

**Module 1: Introduction to Design Systems**

**Subtopics:**

What is a Design System? (Theoretical + Video)

- Definition, purpose, and significance.

- Activity: Analyze a popular app for consistency (like Swiggy)

Difference between Design System, Style Guide, and Pattern Library (Theoretical)

- Distinctions and overlaps.

- Example: Comparing Swiggy's UI components and patterns.

- Assessment: MCQs and type-in answers.

Benefits and Impact of Design Systems (Theoretical + Video)

- Consistency, efficiency, scalability.

- Real-world examples: Material Design and IBM Carbon.

- Activity: Identify inconsistencies in a poorly designed mockup.

**Module 2: Foundations of a Design System**

**Subtopics:**

Core Principles and Design Tokens (Theoretical)

- Colors, typography, spacing, and accessibility

- Activity: Create a basic color palette and typography hierarchy

- Colour-Example: Using the 60-30-10 rule

- Assessment: MCQs on hierarchy, contrast, and legibility.

Building Blocks: UI Components and Atomic Design (Practical)

- Understanding atomic design methodology

- Activity: Design a button, input field, and search bar using Figma

**Module 3: Components of a Design System**

**Subtopics:**

UI Components: Buttons, Inputs, Forms, Navigation Bars (Theoretical + Practical)

- Anatomy and best practices for each component.

- Activity: Create a navigation bar with iconography

- Assessment: MCQs on standard dimensions and attributes.

Design Patterns and Templates (Theoretical + Video)

- Creating patterns for recurring UI scenarios.

- Activity: Design a simple layout.

Interaction Design: States and Transitions (Theoretical)

- States: Hover, active, disabled.

- Transitions and micro-interactions.

- Activity: Create interactive components using Figma.

**Module 4:Design System Documentation**

**Subtopics:**

Purpose of Documentation (Theoretical)

- Communicating a design system effectively.

- Example: Importance of documentation in maintaining consistency.

Documentation Tools: Figma (Video + Practical)

- Overview of tool and their features.

- Activity: Document a component using Figma's Local Style

- Assessment: Submission of a documented UI component.

Versioning and Maintenance (Theoretical)

- Keeping documentation relevant

- Example: Handling design system evolution in real projects.

A final capstone project with a peer review process.Certification upon successful completion of all modules s awarded

## 4.3.4 Output Artefacts

**User flows**

Mapped a basic task flow to map each step of the learner's experience-from exploring a concept to completing a challenge. These flows ensured clarity, reduced cognitive load, and helped align learning objectives.
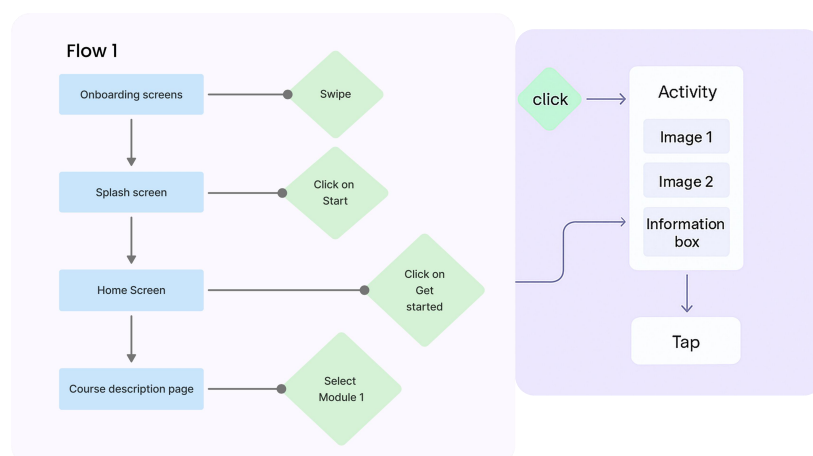


*Figure 15:task flow defined*

**Concept boards**

Mood boards was established with a clean, modular, and playful visual tone looking at the current platforms and inspirations around gamified, leaning platforms which are there in the market
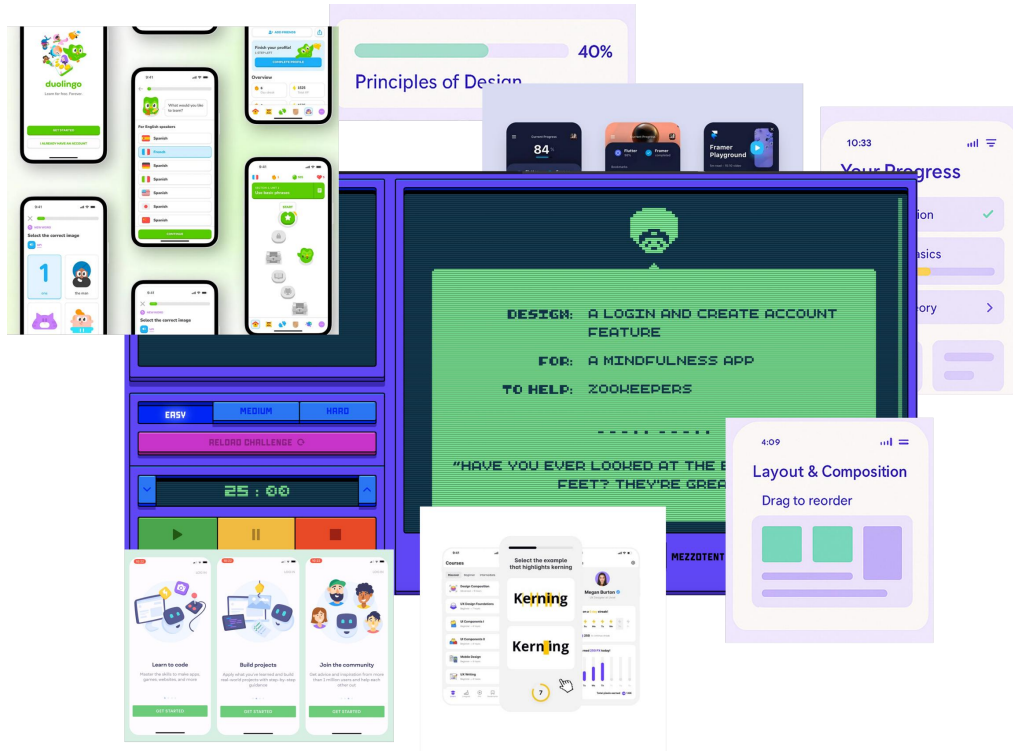


*Figure 16:Mood board, Inspiration board*

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# 4.4 Prototype

The top-priority ideas were developed into a fully functional outcome in  this phase, which included brand design, wireframe creation based on key features, curriculum development, a style guide, high-fidelity mockups, and a working prototype.

## 4.4.1 Brand Design and Style Guide

**Brand Name: Design.IO**

The name Design.IO was born out of a simple question:

> *How can we capture the essence of practical, modern design learning in just a few letters?*

logo creatively fuses abstract geometric forms to represent a dynamic and interactive learning ecosystem. The main visual mark is a stylized lowercase "d" and "i", constructed from bold, clean shapes

- A circular yellow dot atop the "i" symbolizes knowledge, discovery, and interaction-core values of learning and gamification.

- The purple "d" stands for design, built from a modern, friendly font shape that suggests approach-ability and creativity.

- A green semi-circle cuts through the "d", symbolizing structure, systems, and growth-mirroring how learners gain foundational knowledge in design systems.

- The typography "Design.IO" below the mark is set in a soft, rounded sans-serif with a purple hue and a standout yellow dot as a period, reinforcing the friendly yet tech-savvy nature of the platform.



Figure 17: Design.IO Logo

**Reasoning Behind the Name**

Design.IO is more than just a name-it's a statement about how design education should evolve.

The word "Design" represents the platform's core focus: empowering learners to master the craft of interface and system design through a deep understanding of structure, usability, and aesthetics.

The ".IO" extension plays a dual role:

- As a tech-forward domain suffix, it signals innovation, interactivity, and a digital-first approach, commonly associated with tools, platforms, and startups.

- Conceptually, "IO" stands for "Input/Output", a nod to the foundational principle of learning by doing. Learners input their curiosity and effort, and in return, output real-world, practical design skills.

Together, Design.IO embodies a learning environment where theory meets practice, structure meets creativity, and users evolve into creators through engaging, gamified, and thoughtfully crafted learning experiences.
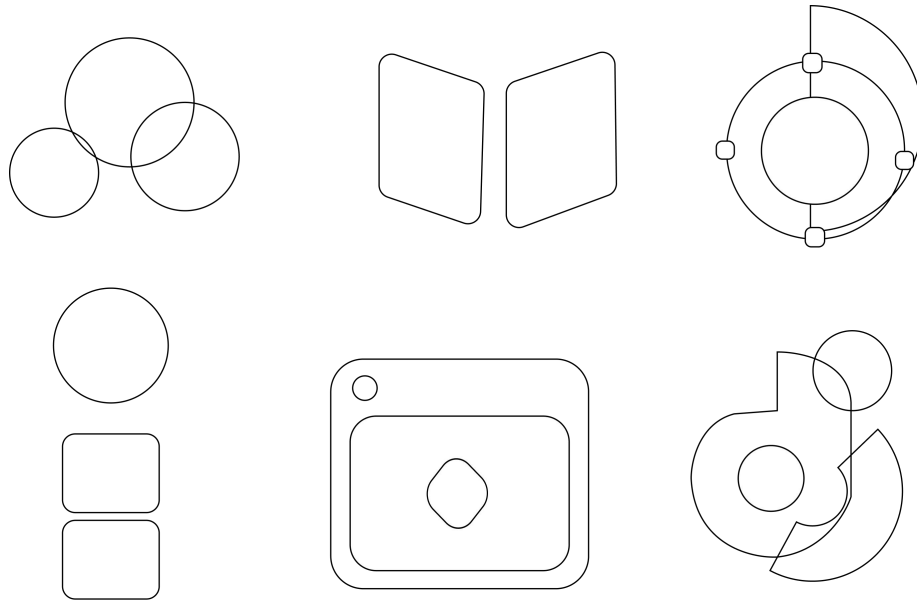
**Logo Exploration**



*Figure 18: Logo exploration*
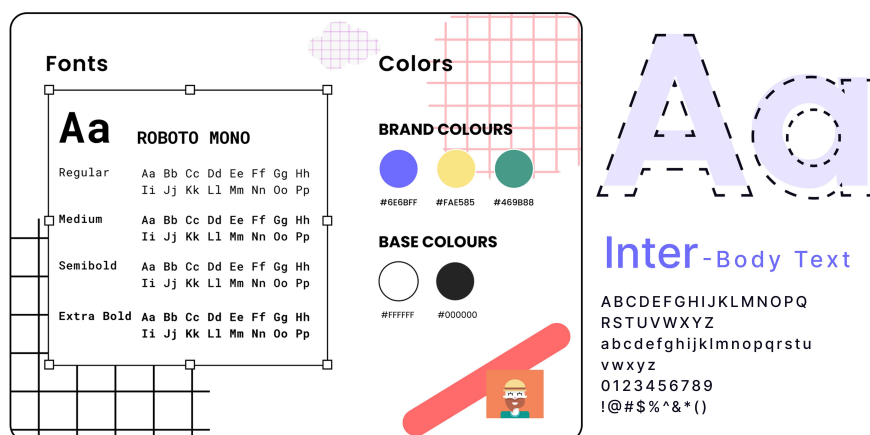
**Style Guide**



*Figure 19: Style guide*

### 4.4.2 Wireframe Design

Low-fidelity wireframes outlined core content zones and responsive UI layouts.The main focus was on core features while creating wireframes
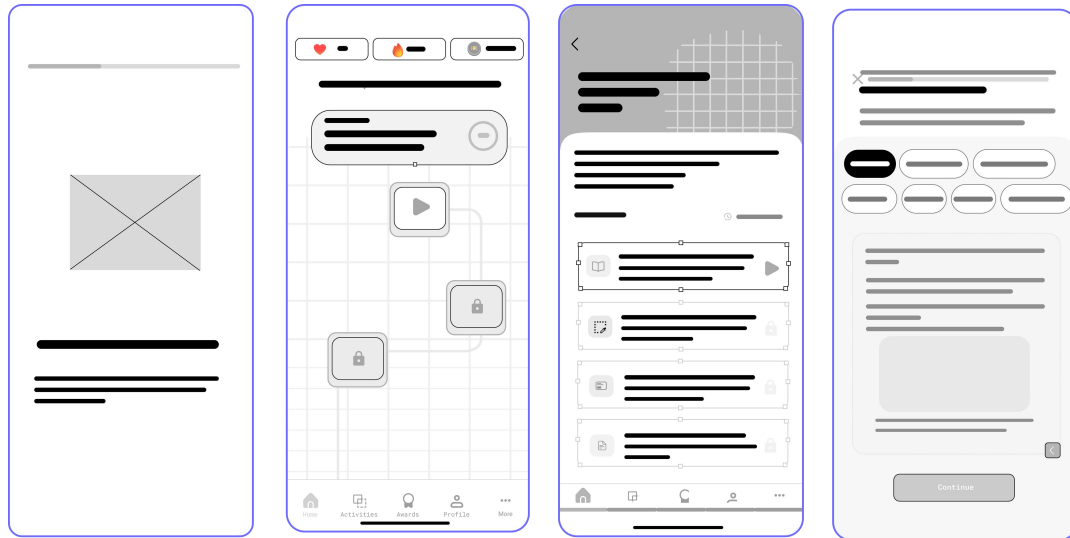


*Figure 20:Wireframes*
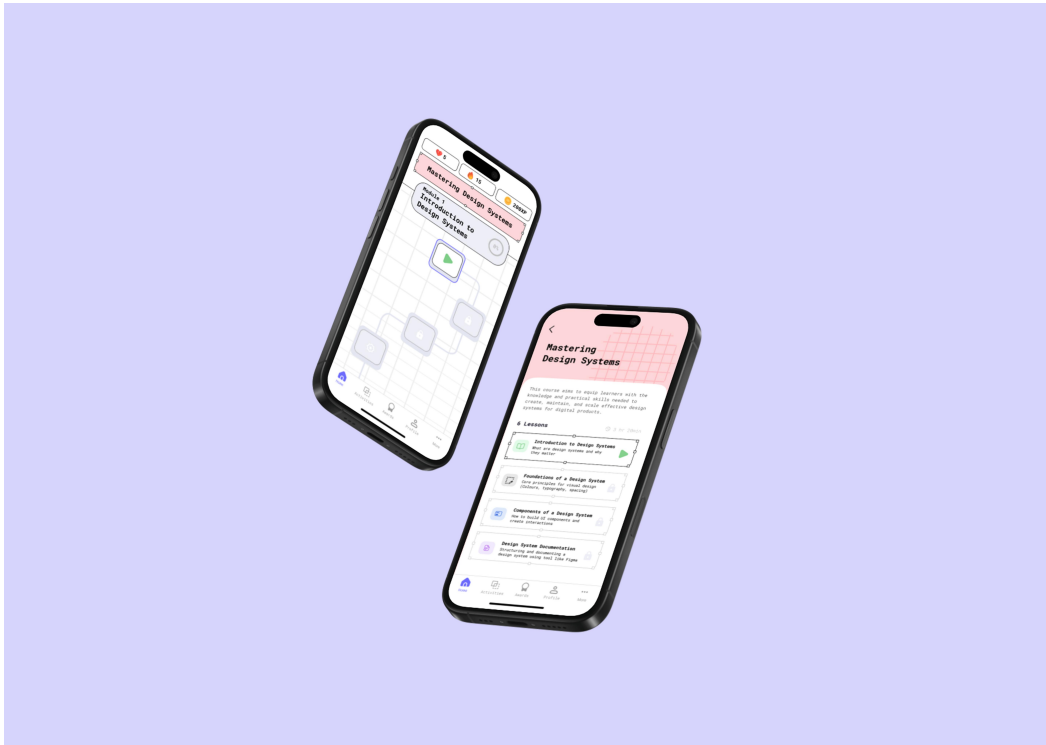
### 4.4.3 High-fidelity mockups

*Figure 21: final screens*

### 4.4.3 Key Prototype Features of the platform

**Gamified Learning Modules**

- **Description:** Each design system concept (like color, type, consistency) is broken into mini-modules with interactive activities.

- **Purpose:** Increases engagement and retention by rewarding progress through badges, points, and streaks.

**Drag-and-Drop & Tap Interactions**

- **Description:** Each Activities use intuitive gestures to let users match, organize, or build design components.

- **Purpose:** Encourages active learning and mirrors real-world design tool interactions.

**Progress Tracking & Visual Feedback**

- **Description:** Progress bars, completion rings, and in-module feedback let learners know how they're doing.

- **Purpose:** Reinforces a sense of accomplishment and helps track mastery of design system topics.

**Modular, Micro-Learning Structure**

- **Description:** Content is chunked into bite-sized lessons—like one screen = one learning outcome.

- **Purpose:** Reduces cognitive load and supports focused, self-paced learning.

**Interactive Videos**

- **Description:** Videos are embedded with questions or mini-challenges.

- **Purpose:** Makes passive content interactive, testing comprehension live.

**Real-World Design Challenges**

- **Description:** Challenges that ask users to identify or correct UI mistakes in mockups..

**Purpose:** Bridges theory to practical application, a core aim of the platform.

### 4.4.3 Prototype Link

UI interactions was designed to learn by doing model and other models which was identified to  enhance the learning experience and user goals



Design tools included **Figma**, **Illustrator**, and **Miro**, facilitating collaborative and iterative design.

# 4.5 Testing and feedback

The final phase validated the prototypes with real users through formative usability testing and structured feedback sessions. To ensure the platform was not only functional but also meaningful

### 4.5.1 Testing Approach

Conducted with 6 government school students (Class 12, design stream) in a moderated, in-person setup.

Participants explored the platform, completed challenges, and provided feedback via interviews and surveys.



*Figure 22:Participants performing in testing*

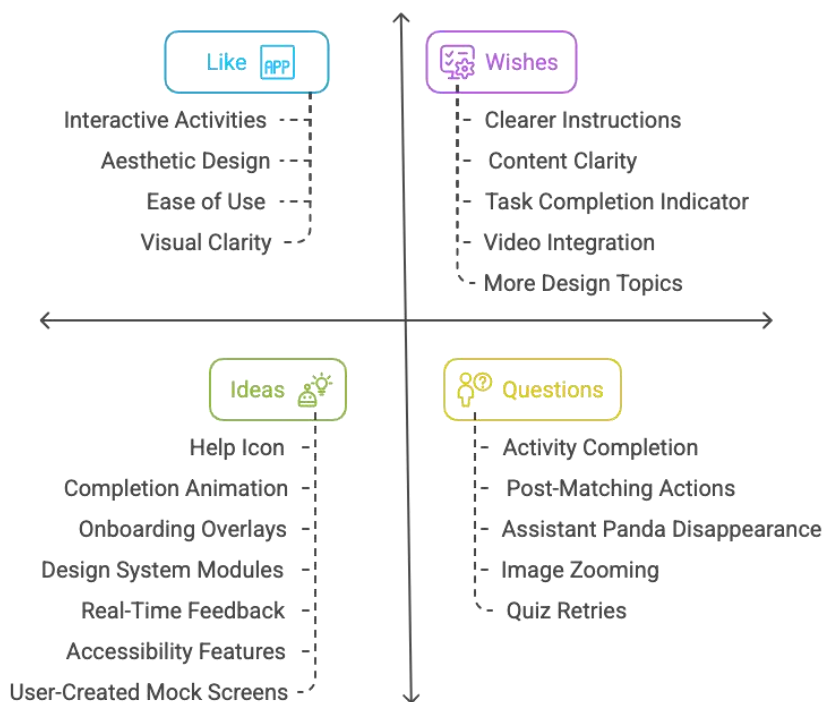## 4.5.2 Feedback Capture Grid



*Figure 23: Feedback capture grid*

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