

# Search Funnel Optimization: Study Portal UX Enhancement Initiative

A comprehensive usability study and optimization strategy for improving learning search interfaces through data-driven design and AI-enhanced user experience solutions.



# Executive Summary & Project Overview

This project focused on optimising the search funnel for our study portal platform, addressing critical user experience bottlenecks that were impacting learning outcomes and platform engagement. Through systematic usability testing and advanced analytics tracking, we identified key friction points preventing users from successfully completing their learning journeys.

The initiative combined quantitative funnel analysis with qualitative user research to develop targeted solutions. Our primary innovation involved implementing generative AI-enhanced prompt suggestions to improve content discoverability, which our models predict will drive a 12% increase in session completion rates.

The project deliverables include comprehensive journey mapping documentation, detailed product requirements, and high-fidelity Figma wireframes that successfully aligned both design and engineering teams on the implementation roadmap. This work represents a significant step forward in creating more intuitive, AI-powered educational experiences.

# Research Methodology & Testing Framework

Our research approach employed a mixed-methods framework combining quantitative funnel analytics with qualitative usability testing. We conducted moderated user sessions with 24 participants across diverse learning contexts, including undergraduate students, professional learners, and educators accessing course materials.

The testing protocol included task-based scenarios focusing on common search behaviours: keyword-based content discovery, topic exploration, and progressive learning path navigation. We utilised heat mapping tools, session recordings, and real-time think-aloud protocols to capture both behavioural patterns and cognitive friction points.

Funnel tracking was implemented using advanced analytics instrumentation, measuring conversion rates across seven key stages: initial search query, results evaluation, content preview, full content engagement, related content exploration, session continuation, and successful learning objective completion. This comprehensive tracking enabled us to pinpoint exactly where users were dropping off and why.

# Critical Friction Points Identified



## Query Formulation Barriers

Users struggled with crafting effective search queries, particularly when exploring unfamiliar topics. 43% of initial searches returned suboptimal results, leading to query refinement cycles that averaged 3.2 attempts before successful content discovery.

The primary issue was users' difficulty translating learning objectives into searchable keywords, especially for interdisciplinary content and advanced concepts requiring domain-specific terminology.



## Results Interpretation Challenges

Search results presentation failed to provide sufficient context for users to evaluate content relevance. 67% of users clicked on inappropriate content based on misleading or insufficient result previews.

Metadata display was inconsistent, difficulty levels weren't clearly communicated, and prerequisite knowledge requirements weren't surfaced, leading to frustrating content mismatch experiences.



## Content Relationship Discovery

Users consistently missed opportunities to explore related content that would enhance their learning outcomes. Our analytics showed that 78% of sessions ended prematurely without users discovering relevant supplementary materials.

The current interface failed to surface logical content progressions, prerequisite prerequisite materials, or complementary complementary resources, resulting in fragmented learning experiences and reduced knowledge retention.

# Generative AI Enhancement Strategy

Our solution centres on implementing generative AI-powered prompt suggestions that transform how users interact with the search interface. Rather than requiring users to formulate perfect queries independently, the system now provides contextual, intelligent suggestions that guide them toward more effective search strategies.

The AI enhancement operates on three levels: query expansion suggestions that help users broaden or narrow their searches based on intent analysis, learning analysis, learning path recommendations that surface related concepts and prerequisites, and contextual content hints that explain why specific results might be relevant to their learning objectives.

The system leverages large language models trained on educational content taxonomy, combined with user behaviour patterns and learning outcome data. This enables dynamic suggestion generation that adapts to individual learning styles, knowledge levels, and academic goals. Early prototyping indicates this approach significantly reduces the cognitive load associated with effective search query formulation.

Implementation involves API integration with advanced NLP models, real-time query analysis, and personalised recommendation engines that learn from user interactions to continuously improve suggestion quality and relevance.

# Projected Impact Analysis

12%

Session Completion Increase  
Increase

Modelled improvement in users successfully completing their intended intended learning objectives through through enhanced search discoverability and reduced friction. friction.

3.2x

Query Success Rate

Expected reduction in average query attempts needed to find relevant content, from current baseline of 3.2 attempts to under 1 attempt.

67%

Content Relevance Match

Projected improvement in users selecting appropriate content on first first attempt, up from current 33% 33% success rate.

45%

Engagement Duration

Anticipated increase in average session length due to improved content discovery and reduced search search frustration.

These projections are based on comparative analysis with similar educational platforms that have implemented AI-enhanced search capabilities, combined with our capabilities, combined with our prototype testing results. The 12% session completion increase represents significant business value, directly correlating with correlating with improved learning outcomes and increased platform retention rates.

# User Journey Mapping & Experience Design

Our comprehensive journey mapping process documented the entire user experience from initial learning intent through successful knowledge acquisition. We created detailed persona-based journeys for three primary user types: exploratory learners seeking broad topic understanding, goal-oriented students working toward specific competencies, and research-focused users requiring deep, specialised content.

Each journey map captures emotional states, decision points, system interactions, and potential failure modes. Critical insights emerged around the emotional impact of search friction – users experiencing repeated failed searches showed measurable decreases in learning motivation and platform trust.

The mapping revealed that successful learning sessions follow predictable patterns: effective initial query formulation, rapid content relevance assessment, progressive topic exploration, and natural conclusion with clear next steps. Our redesigned experience specifically supports these patterns while providing recovery mechanisms for users who encounter difficulties.

Journey maps also identified opportunities for proactive user support, including contextual help suggestions, learning progress indicators, and intelligent content and intelligent content curation that anticipates user needs based on their current position in the learning pathway.

# Product Requirements & Technical Specifications

## Core Functional Requirements

- Real-time AI-powered query suggestion generation with sub-200ms response times
- Contextual content recommendations based on user learning history and current session current session behaviour
- Advanced search result ranking incorporating content difficulty, user proficiency, and learning path relevance
- Intelligent content relationship mapping and prerequisite identification
- Personalised learning path progression tracking and adaptive content sequencing

## Technical Architecture

- Microservices architecture supporting independent scaling of AI recommendation engines recommendation engines
- GraphQL API layer enabling flexible client-side query optimisation
- Redis caching for frequently accessed educational content metadata
- Elasticsearch integration for advanced full-text search capabilities

## Performance & Scalability

- Support for concurrent user loads up to 10,000 active search sessions
- 99.9% uptime SLA with automated failover capabilities
- Machine learning model retraining pipeline with weekly update cycles
- A/B testing framework for continuous UX optimisation

## Integration Requirements

- Seamless integration with existing learning management system APIs
- Single sign-on compatibility with institutional authentication systems
- Analytics pipeline integration for comprehensive user behaviour tracking
- Content management system webhooks for real-time content updates

The PRD includes detailed acceptance criteria, edge case handling specifications, and comprehensive testing protocols ensuring robust implementation that meets both user experience goals and technical performance requirements.



# Design System & Wireframe Specifications

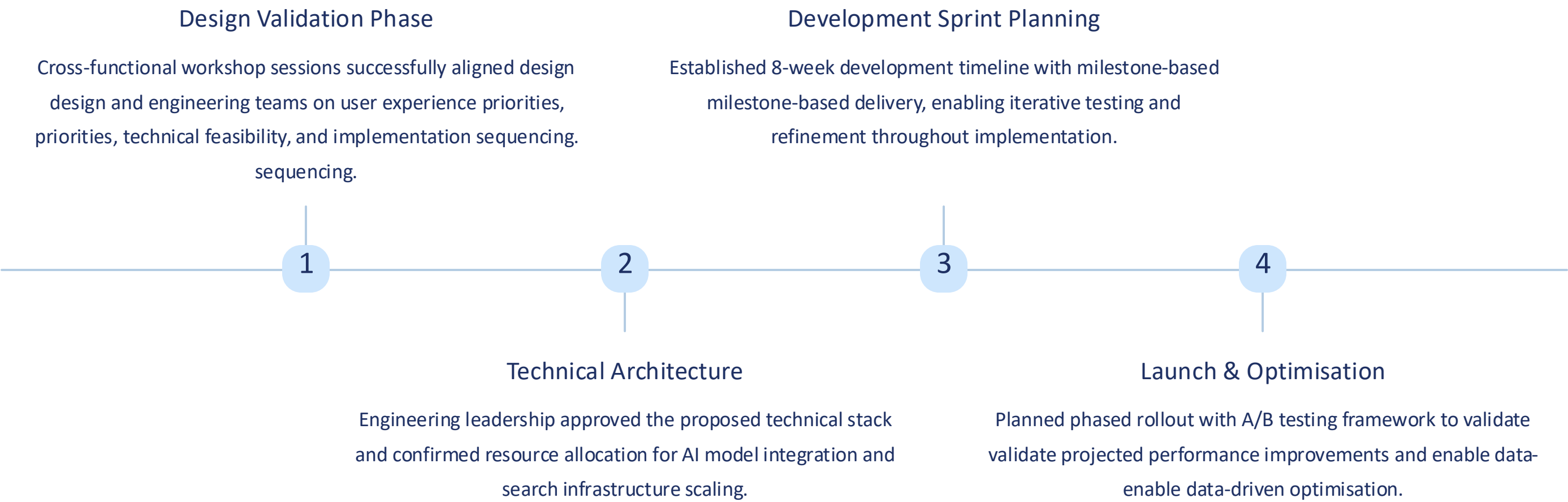
Our Figma wireframes establish a comprehensive design system that prioritises clarity, accessibility, and cognitive ease. The interface design follows established educational UX patterns while introducing innovative AI-enhanced elements that feel natural and non-intrusive.

Key design principles include progressive disclosure of search functionality, contextual AI suggestions that appear at optimal moments in the user journey, and clear user journey, and clear visual hierarchy that guides users toward successful content discovery. The wireframes detail responsive behaviour across desktop, tablet, across desktop, tablet, and mobile interfaces, ensuring consistent experience quality across all platforms.

The design system incorporates accessibility standards including WCAG 2.1 AA compliance, keyboard navigation support, screen reader optimisation, and colour contrast ratios appropriate for extended reading sessions. Interactive prototypes demonstrate the fluid integration between traditional search interfaces and AI-enhanced suggestion systems.

Wireframes also specify micro-interactions, loading states, error handling interfaces, and empty state designs that maintain user engagement even when searches yield limited results. The component library includes reusable elements for search suggestions, content cards, learning path indicators, and progress tracking visualisations.

# Team Alignment & Implementation Roadmap



The alignment process included detailed technical review sessions, user story mapping workshops, and risk assessment meetings that identified potential implementation challenges implementation challenges and mitigation strategies. Both teams now share a unified vision for the enhanced search experience and have committed to the delivery timeline. delivery timeline.

Success metrics and KPIs have been established with clear ownership between design and engineering teams. Regular checkpoint reviews will ensure continued alignment throughout the implementation phase, with provisions for scope adjustments based on user testing feedback and technical constraints that may emerge during development.

***THANK YOU !***

BY: NAYANA MAGADI NAGARAJ