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Designing a University Course Through UX Design and Human-Centered Design: A Practical Learning Approach Using Regional Problem-Solving Cases

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Abstract: This study reports the design of a university course that integrates User Experience (UX) design and Human-Centered Design (HCD) into project-based learning for regional problem solving. The course engages learners in a full HCD cycle—understanding context, specifying requirements, producing design solutions, and evaluating prototypes—while collaborating with local residents and government agencies. Professional tools such as FigJam and Figma were incorporated to support collaborative ideation and prototyping. Preliminary results from the analysis of open-ended responses revealed evidence of learner growth and insights. In future work, we plan to examine learner development through the introduction of iterative redesign cycles and the utilization of learner data.

Keywords: User Experience (UX), Human-Centered Design (HCD), Regional Problem Solving, Design Education, Figma, FigJam

1. Introduction

In recent years, User Experience（hereafter UX) Design and Human-Centered Design (hereafter HCD) have attracted attention as design methodologies that emphasize the experiential value of users（Kurosu, 2010; Norman, 2013）. These approaches are effective not only in product development but also in the field of education, and their application has been expanding (Kurosu, 2010; Kurosu et al., 2012).

While these approaches are widely applied in product development, their integration into higher education—particularly in courses addressing regional problem solving—remains limited. The first author, working as both an industry designer and lecturer, observed that UX/HCD frameworks help learners better understand community issues and structure their problem-solving processes (Yamamoto et al., 2025).

However, existing studies often focus on product-oriented outcomes or information literacy, with limited empirical reporting on UX/HCD-based educational practices involving collaboration with local communities. This study therefore aims to design a course model that embeds UX and HCD processes into regional problem-solving education and to examine its potential contributions to learners' creative and collaborative competencies.

2. Course Design

2.1 Overview of the Course Design

This course was implemented as a project-based learning (PBL) experience in which students addressed authentic regional challenges through the application of UX design and HCD. The course followed the four phases of the HCD process (Figure 1)—understanding the context of use, specifying user requirements, producing design solutions, and evaluating those solutions—allowing learners to experience a complete design cycle within one semester. Students worked in groups under a realistic scenario in which they acted as designers commissioned by a municipal office to propose revitalization strategies for a declining shopping district. Regional maps, demographic data, and environmental conditions were provided to support contextual understanding (Figure 2(a, b, c)).
To analyze user needs, groups used “FigJam” (Figma Inc., 2026a) to conduct value laddering and organize insights visually. Based on these findings, students developed project proposals using a 5W1H framework and presented them in a mock design-competition format. In the subsequent design phase, learners created wireframes emphasizing structural clarity and UX consistency, followed by interactive prototypes developed in Figma (Figma Inc., 2026b). Prototypes were refined through instructor feedback and usability simulations. The course concluded with a final design-competition evaluation, where prototypes were assessed based on regional value, usability, accessibility, and emotional impact.

3. Design Results and Discussion

This study suggests that the course design successfully enabled students to experience the process of addressing regional issues through the integration of UX design and the HCD process. The findings indicate that incorporating UX and HCD frameworks is effective for designing learning environments in which students can engage in problem-solving activities related to regional contexts. However, because the course used a fictional region as the design context, future iterations may benefit from adopting an actual community to enhance realism and authenticity in the learning experience.
Since the statistical analysis has not yet been fully completed, we present the learners’ free-response comments as preliminary results. Learners reported increased interest in design-related fields and described the course as both challenging and rewarding. Comments included: “I became even more interested in the field of web design,” “The process from planning to production was challenging and the presentation was nerve-wracking, but I felt a strong sense of accomplishment,” and “The course was quite difficult, but I enjoyed thinking deeply and engaging in trial and error.”

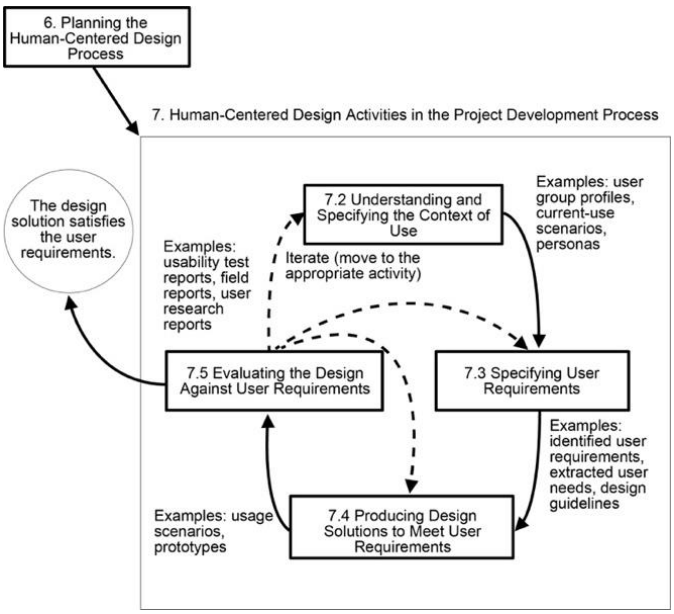
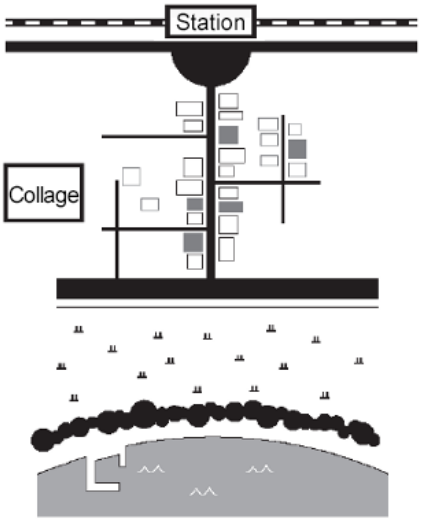


Figure 1. Human-Centered Design (HCD) Process.
Adapted by the author from Figure 6-2 in Kurosu (2020), UX Principles: From Usability to User Experience, Kindai Kagaku-sha [in Japanese, translated to English by authors], p.173. Reproduced with permission from the original author.



(a) Regional Maps

- You are a new designer at Design Company A.
- You have received a request from Mr. C, who works in the Urban Planning Division of City B's municipal office, to create a project proposal and a web prototype (website or application) to promote the project.
- Assuming the existence of a shopping district with the following conditions, you are asked to develop a comprehensive strategy to revitalize the area, taking into account local facilities, events, and environmental characteristics.
- Additionally, you have been asked to present your proposal to Mr. C's supervisors (Mr. D and Mr. E) to obtain their approval.
- Your goal is to gain client agreement and have your proposal and web prototype selected.

(b) Scenario

- Population: approximately 30,000.
- Declining proportion of young residents.
- Several shops in the shopping district have closed due to aging owners and lack of successors.
- A large area of abandoned farmland is located at the edge of the shopping district.
- The sea and a fishing port are located several kilometers away.
- A national highway runs between the abandoned farmland and the shopping district.
- The climate is warm, with little rainfall and stable weather.
- A university is located a short distance away.
- There is an open plaza in front of the train station.

(c) Conditions

Figure 2. Scenarios and Regional Maps Provided as Design Challenges in the Course. (The scenarios and maps were created by another instructor and are reproduced here with permission.)

4. Conclusion and Future Work

This study presented the design of a university course that integrated UX design and HCD for regional problem solving. The course provided experiential learning opportunities that closely aligned with real-world design practice. Preliminary results from the analysis of open-ended responses revealed evidence of learner growth and insights. Future work will incorporate iterative redesign cycles and utilize learner data to examine learner development in greater depth.

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References

FigJam. (2026). Retrieved February 22, 2026, from https://www.figma.com/figjam/

Figma. (2026). Retrieved February 22, 2026, from https://www.figma.com/

Kurosu, M. (2010). User experience and satisfaction: Toward establishing the concept and measurement of student satisfaction. *Journal of the Open University of Japan, 28*, 71–83 (in Japanese).

Kurosu, M. (2020). *UX genron: Yūzābiriti kara UX e [Principles of UX: From usability to UX]*. Kindai agaku Sha (in Japanese).

Kurosu, M., Nakagawa, M., & Fujita, T. (2012). Human-centered design education: Practice in the UU program at Tokyo University of Agriculture and Technology. *Human-Centered Design, 7*(1), 27–39 (in Japanese).

Norman, D. A. (2013). *The design of everyday things (Revised and expanded ed.). Basic Books.*

Yamamoto, F., Nakano, H., & Kubota, S. (2025). Design and development of a "reaction collection and sharing system" based on UX design and Google Workspace. *IPSJ Research Report, 45*(13), 1–8 (in Japanese).