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Design of User Interface (UI) and User Experience (UX) for the Visual Communication Design Student Works Data Center

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Abstract
Inadequate documentation and limited accessibility of student works remain persistent issues in Visual Communication Design (VCD) programs, reducing their effectiveness as academic portfolios and institutional repositories. This study aims to design and empirically evaluate a user interface (UI) and user experience (UX) for a VCD student who work in a data center that emphasizes usability, visual clarity, and local cultural relevance. A mixed-methods approach was employed, integrating qualitative user needs analysis through interviews and surveys with quantitative usability evaluation. The design process was guided by the Design Thinking framework, encompassing the stages of empathize, define, ideate, prototyping, and testing. Usability testing using the System Usability Scale (SUS) yielded a score of 84.8, indicating excellent system usability, while the Net Promoter Score (NPS) reached +62.5, reflecting high user satisfaction and recommendation intent. The findings demonstrate that the proposed UI/UX design significantly enhances system usability, user engagement, and accessibility of student works. This study contributes an empirical UI/UX design model for art-based academic repositories by integrating usability evaluation with local cultural elements to support sustainable documentation and appreciation of student creative outputs.

INTRODUCTION

The development of digital technology has significantly transformed the academic landscape, particularly in the way educational institutions store, present, and disseminate students' works. In the field of Visual Communication Design (VCD), student works function not only as individual portfolios but also as representations of the institution's creative and cultural capacity. In the current digital era, these works hold substantial value as learning materials, media for appreciation, and reflections of institutional quality. However, in practice, many institutions still lack an effective centralized data system for student works, especially in terms of user interface (UI) and user experience (UX), which are essential to enhance accessibility and exposure. As a result, student works are often poorly documented, difficult to access, and dispersed without proper structure, diminishing their potential to serve as tools for appreciation, collaboration, and evaluation. This issue is further reinforced by the fact that most

digital platforms developed by educational institutions tend to focus primarily on administrative and instructional functions, rather than providing a responsive and interactive data center that optimizes both UI and UX aspects (Mujiono et al., 2025).

Several previous studies have emphasized the importance of user interface (UI) and user experience (UX) in enhancing the effectiveness of academic information systems and e-learning platforms (Putri et al., 2023). The *design thinking* approach has also been proven effective in designing academic systems based on user needs through the stages of empathy, definition, ideation, prototyping, and testing (Darmawan et al., 2022). Other research indicates that the quality of digital repositories can be improved through the application of *design thinking*, which integrates active user involvement throughout the design process (Ramadhan & Adam Sekti Aji, 2024). However, these studies generally remain focused on the context of e-learning, general academic systems, or non-art repositories.

Meanwhile, the *User-Centered Design* (UCD) approach has also been proven effective in creating more functional UI/UX designs by understanding users' needs, behaviors, and motivations, as well as through iterative testing that incorporates user feedback (Muktamar et al., 2023). Standardized evaluation methods such as the *System Usability Scale* (SUS) and the *User Experience Questionnaire* (UEQ) are commonly employed to measure interface quality and are often complemented by *A/B testing* to objectively compare alternative design options (Zermeño et al., 2024) (Quin et al., 2014). However, these studies have not specifically examined student work repositories in the field of Visual Communication Design (VCD), which possess distinctive characteristics in terms of aesthetics, visual exploration, and local cultural representation.

Furthermore, research that integrates cultural elements into interface design remains limited. In fact, the incorporation of traditional motifs, distinctive color schemes, and visual narratives rooted in local wisdom, such as the Minangkabau culture, has the potential to enrich design outcomes while simultaneously reinforcing institutional identity (Ariel Tandra & Rofil, 2023), (Wang & Zhao, 2022). In addition, innovations such as the development of virtual galleries that enable users to explore student works interactively are still rarely found in previous studies. Most existing research has focused primarily on repository or final project monitoring systems, which generally lack interactive features that highlight aesthetic and cultural values (Subiyakto et al., 2021).

Thus, this study addresses the identified research gap by designing a user interface for a Visual Communication Design (VCD) student work data center based on the *design thinking* framework, incorporating *System Usability Scale* (SUS) evaluation and *A/B testing*. Additionally, it adopts elements of Minangkabau culture and the concept of a virtual gallery to create a more immersive and contextually rich exploration experience.

Based on these conditions, this study formulates several key research questions: (1) What are the needs and expectations of users (students, lecturers, and institutions) regarding the data center platform for Visual Communication Design (VCD) student works? (2) How can a responsive, aesthetic, and user-friendly UI/UX design be developed that also reflects local cultural values within a digital student work repository? and (3) How effective is the developed interface in improving user satisfaction and ease of use? To address these questions, the study employs a *mixed-methods* approach that combines qualitative techniques (interviews and surveys) with quantitative evaluation of user satisfaction. The design process follows the principles of *design thinking* to ensure that the resulting design aligns with users' real needs and contextual experiences.

The objective of this study is to design and develop a user interface (UI) and user experience (UX) for a Visual Communication Design (VCD) student work data center that is responsive, aesthetic, and easily accessible. This research offers novelty through its specific focus on an art-based student work data center, the integration of aesthetic and local cultural elements in UI/UX design, and the application of a *mixed-methods* approach grounded in *design thinking* within the context of higher education in the arts in Indonesia. This approach represents a user-centered problem-solving method that is highly suitable for designing user interfaces and user experiences. *Design thinking* consists of five main stages: empathy, define, ideate, prototyping, and testing (Khairunnisa & Lanova,

2024) (Khairunnisa et al., 2024). Academically, this research is expected to contribute to the growing body of literature on UI/UX in educational information systems. Practically, it produces a software design for a student work data center that can be implemented to enhance the documentation, appreciation, and curation of student works more effectively. From an institutional perspective, this study serves as an effort to strengthen academic reputation, monitor student achievements, and increase competitiveness through the provision of a representative digital repository.

Despite extensive studies on UI/UX design in academic information systems, most existing research focuses on learning management systems, administrative platforms, or general institutional repositories. Limited attention has been given to student work data centers within art and design education, which require specific design considerations related to visual exploration, aesthetics, and cultural representation. Moreover, empirical studies that integrate usability evaluation with culturally contextualized interface design remain scarce. This study addresses this gap by proposing a UI/UX design model for a Visual Communication Design student works data center that integrates Design Thinking, quantitative usability testing, and local cultural elements through a virtual gallery approach.

METHOD

This study employed a mixed-methods research design to ensure both contextual relevance and measurable usability outcomes (Braun & Clarke, 2022). Qualitative data were collected through semi-structured interviews and questionnaires involving 100 Visual Communication Design students and 19 lecturers to identify user needs, usability issues, and feature expectations. The qualitative data were analyzed using thematic analysis to generate design requirements. Quantitative evaluation was conducted through usability testing using the System Usability Scale (SUS) and Net Promoter Score (NPS) to assess system effectiveness and user satisfaction. The system development process followed the Design Thinking framework, consisting of empathize, define, ideate, prototyping, and testing stages, with iterative refinement based on user feedback (Creswell & Creswell, 2022).

This study employed a mixed-methods approach that integrates qualitative and quantitative methods to support a user-centered UI/UX design process. Qualitative methods were used to identify user needs, behaviors, and contextual challenges, while quantitative methods were applied to evaluate usability and user satisfaction. The overall design process followed the Design Thinking framework, consisting of five iterative stages: empathize, define, ideate, prototype, and test.

2.1 Empathize

Based on qualitative findings obtained during the empathize stage, observations were conducted to examine how students and lecturers currently access, store, and present their work. In-depth interviews were subsequently carried out to explore the needs, challenges, and expectations of students, lecturers, and program administrators regarding the student work repository. In addition, a user needs survey was administered using a structured questionnaire to collect quantitative data on interface preferences, desired features, and aesthetic considerations.

The insights gathered from these activities were synthesized into user personas representing the key characteristics, behaviors, and needs of the primary users. These personas served as an empirical foundation for identifying core usability and accessibility issues within the existing documentation system.

2.2 Define

At the define stage, qualitative data obtained from observations, interviews, and user personas were systematically analyzed to formulate clear problem statements and design requirements. User journeys were developed to map user interactions, identify pain points, and determine critical touchpoints within the student work data center. This stage translated user insights into specific design criteria related to accessibility, usability, visual organization, and cultural representation, providing a structured basis for subsequent ideation.

2.3 Ideate

During the ideate stage, design solution brainstorming sessions were conducted to

generate alternative UI/UX concepts addressing the identified problems. Navigation structures, system flow diagrams, and interaction scenarios were developed to establish the initial design concept, including system structure, core features, and functional requirements. A low-fidelity wireframe was then created to visualize preliminary design ideas. All proposed ideas were evaluated and prioritized based on their relevance to user needs, technical feasibility, and potential impact on user experience.

2.4 Prototype

At this stage, an interactive high-fidelity prototype was developed using Figma, resulting in a functional UI/UX prototype of the student work data center. The design adhered to fundamental UI/UX principles, including consistency, visual hierarchy, accessibility, and responsive layout. Furthermore, local cultural elements such as traditional color palettes and culturally inspired iconography were integrated to reinforce visual identity and contextual relevance. This prototype functioned as an initial product that could be directly tested and evaluated by users.

2.5 Test

The testing stage focused on evaluating usability, user satisfaction, and overall user experience (Syifa et al., 2025). Prototype testing was conducted using the System Usability Scale (SUS) to quantitatively measure perceived usability and system effectiveness. In addition, the Net Promoter Score (NPS) was employed to assess user satisfaction and recommendation intention, providing complementary insights into user acceptance of the system.

To support this evaluation, heatmap-based interaction analysis was conducted using Maze to observe user behavior patterns, including click distribution, navigation paths, and areas of visual focus across interface elements. The quantitative results from usability metrics and interaction analysis were examined to identify the design's strengths, weaknesses, and areas requiring improvement. This stage was iterative in nature, with insights from testing informing subsequent refinements of the prototype until an optimal design solution was achieved.

Design thinking was chosen because it has been proven effective in developing user-oriented information systems across various academic contexts (Khairunnisa et al., 2024). After completing the *design thinking* process, iterations and revisions were carried out to refine the design based on the testing results, resulting in a finalized prototype and comprehensive design documentation. Finally, the research reporting and the preparation of the scientific article were conducted. To provide a clearer understanding of the research procedures and stages, the following flowchart illustrates both the activities that have been completed and those planned for subsequent implementation.

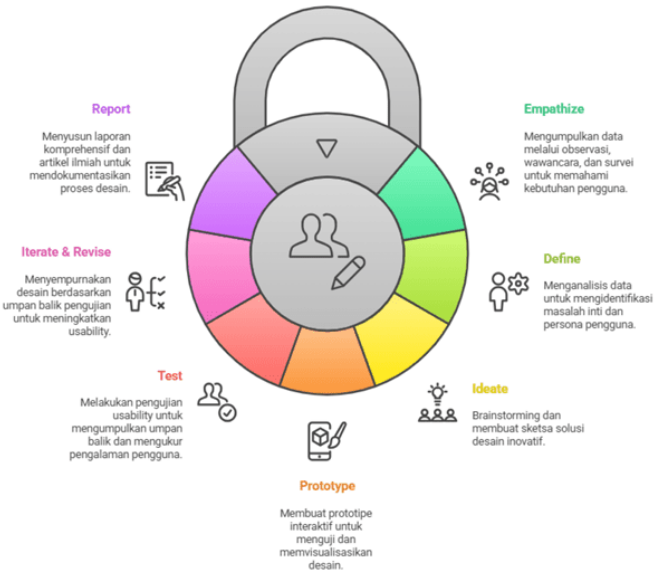


Figure 1. Research Flowchart

RESULT AND DISCUSSION

This study produced a user interface design for the Visual Communication Design (VCD) student work data center using the *design thinking* approach, which consists of five stages: empathy, definition, ideation, prototyping, and testing. Each stage generated specific findings that served as the foundation for the system's development.

3.1 Empathize

The *empathize* stage was carried out through surveys and interviews. The survey was designed and distributed to Visual Communication Design (VCD) students and lecturers to explore user needs and behaviors. It was conducted online via Google Forms, involving 100 student respondents and 19 lecturers. The survey results provided information regarding user needs and behaviors, desired features, and concerns expressed by both students and lecturers.

Interviews were conducted with 10 to 15 participants, consisting of students, lecturers, and program administrators. Based on the interviews and thematic analysis, several recommendations emerged for the proposed application, including the design of a student work data center with tiered access rights, the implementation of institution-based login authentication, and the inclusion of feedback and rating features as part of an open evaluation system for student works.

From the results of the survey and interviews, *user personas* were developed. One example is Nadia, an active student who frequently seeks design references, appreciates visually engaging interfaces and social features such as favorites and comments, but remains hesitant to publish her work due to concerns about plagiarism. The feedback obtained from users like Nadia served as a crucial consideration and foundation for designing an application that is both relevant and aligned with user needs.

3.2 Define

The *define* stage formulates the problem statement and identifies user needs through the development of *Point of View* and *How Might We* statements, as well as the mapping of application feature requirements.

Table 1. Problem Definition

Problem	Insight
They do not yet have an official platform to access or publish their academic works and personal projects.	A platform is needed to enable users to access and publish their academic works and personal projects.
Difficulties are encountered in finding relevant references, engaging interface designs, and reliable work security.	A navigable platform and an engaging virtual gallery are needed to encourage more intensive exploration of student works.

Table 2. How Might We

How	Might
How can a student work data center platform be designed to be easily accessible and visually appealing for users across different academic levels?	Designing a responsive interface that applies modern, user-friendly UI/UX principles, featuring a minimalist layout, clear icons, and readable typography.
How can student works in various visual formats (images, PDFs, and videos) be presented with intuitive navigation and relevant filtering options?	Implementing a filtering system based on work type, medium, year, and creator, while also providing a search function.

3.3 Ideate

After the stages of problem grouping and formulation were completed, the next step was to develop ideas that could serve as solutions to the issues experienced by users. The idea development process was carried out through brainstorming activities aimed at generating the most relevant and effective concepts. In this

way, the UI/UX design of the student work data center could be optimized while minimizing the potential emergence of new problems in the future. The following are the proposed solution ideas:

Table 3. Solution to the Problem

Problem	Solution
There is currently no official platform available for accessing or publishing their academic works and personal projects.	Providing features for work uploads, work searches, and a virtual gallery for students, along with a work validation system managed by lecturers.
Difficulties in finding relevant references, engaging interface designs, and reliable work security.	Providing a search feature and a favorites section for works based on filtering options.

After the most appropriate solution to the identified problems was determined, a visual representation was developed in the form of a flowchart illustrating the design flow of the user interface (UI) and user experience (UX) for the student work data center. This flowchart serves as a systematic guide in designing the interactions and navigation that will be used by the users. The flowchart is presented as follows:

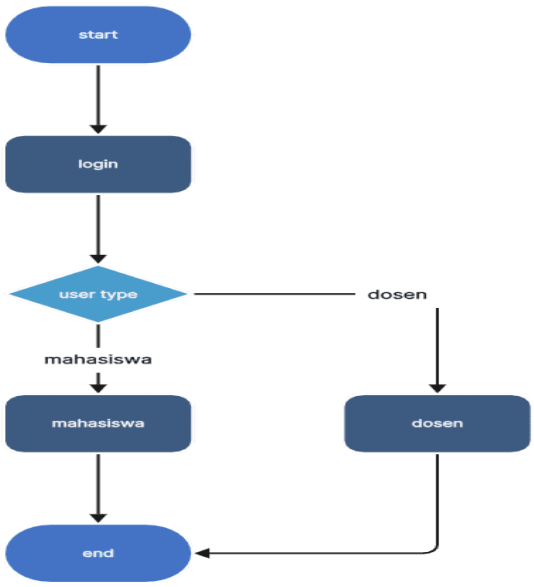


Figure 2. Flowchat

In addition, at this stage, a wireframe was developed focusing on the fundamental elements such as navigation, text, main content, and interactive buttons. The wireframe serves as an initial design that visualizes the structure of the user interface (UI) and user experience (UX) for the student work data center before proceeding to a more detailed design phase. The following is the wireframe that has been created:

Figur 3. Wireframe of the Login Page to the Account Registration Page

Figure 4. Wireframe of the Student Homepage to the Work Search Page

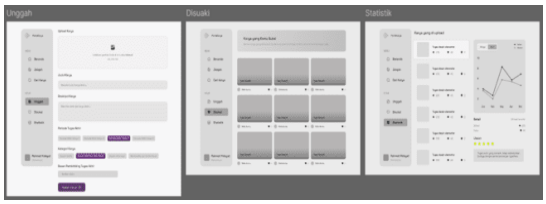


Figure 5. Wireframe of the Upload Page to the Statistics Page

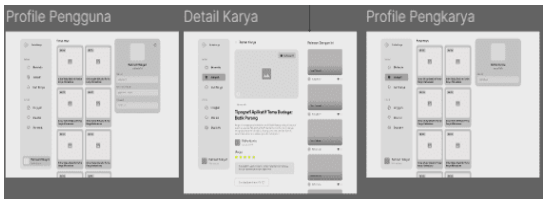


Figure 6. Wireframe of the User Profile Page to the Creator Profile Page

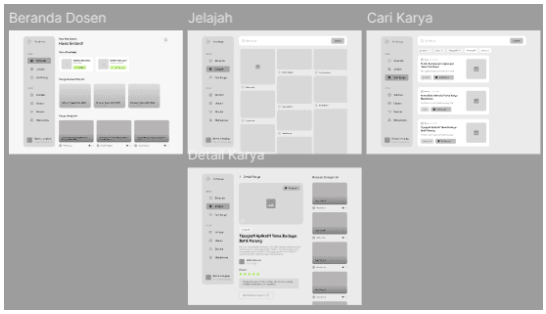


Figure 7. Wireframe of the Lecturer Homepage to the Work Search Page

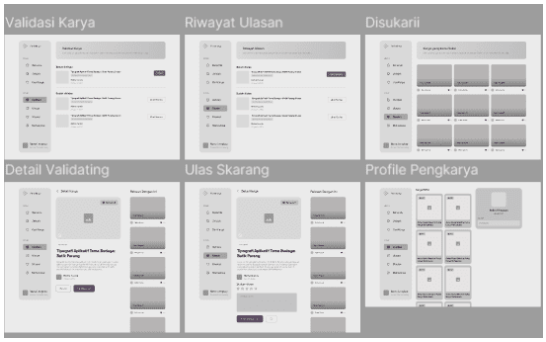


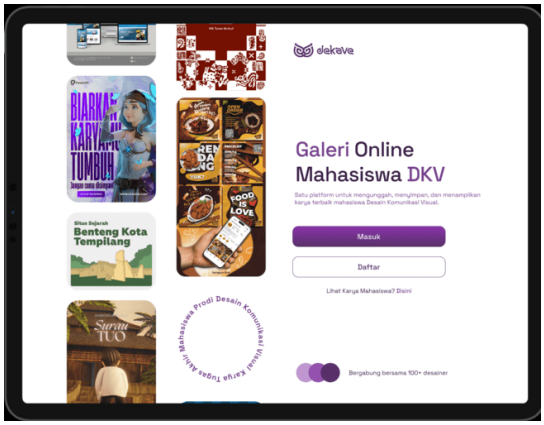
Figure 8. Wireframe of the Work Validation Page to the Creator Profile Page

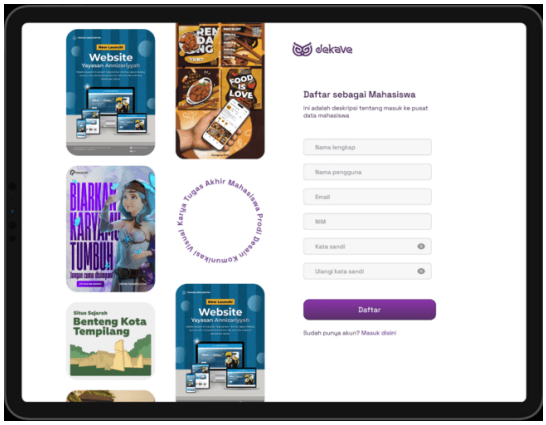
Figure 9. Wireframe of the Student Supervision List Page to the Logout Page

3.4 Prototyping

After the user problems were identified and corresponding solutions were developed, the next stage involved implementing these ideas into a more concrete design. The implementation was carried out through the creation of a high-fidelity design to evaluate user responses toward the application prototype assessing whether it met user needs or required further refinement. If any shortcomings were identified, the design was revised iteratively until an optimal level of user satisfaction was achieved.

The high-fidelity design process followed a systematic workflow, resulting in a prototype of the user interface (UI) and user experience (UX) for the student work data center. Therefore, the developed prototype needed to be detailed, with features precisely tailored to user requirements. Through this detailed prototype, the interface design could be visualized in a realistic form. The results of this application design are presented up to the prototype stage, showcasing several interface and user experience layouts of the student work data center. The application prototype is presented as follows:





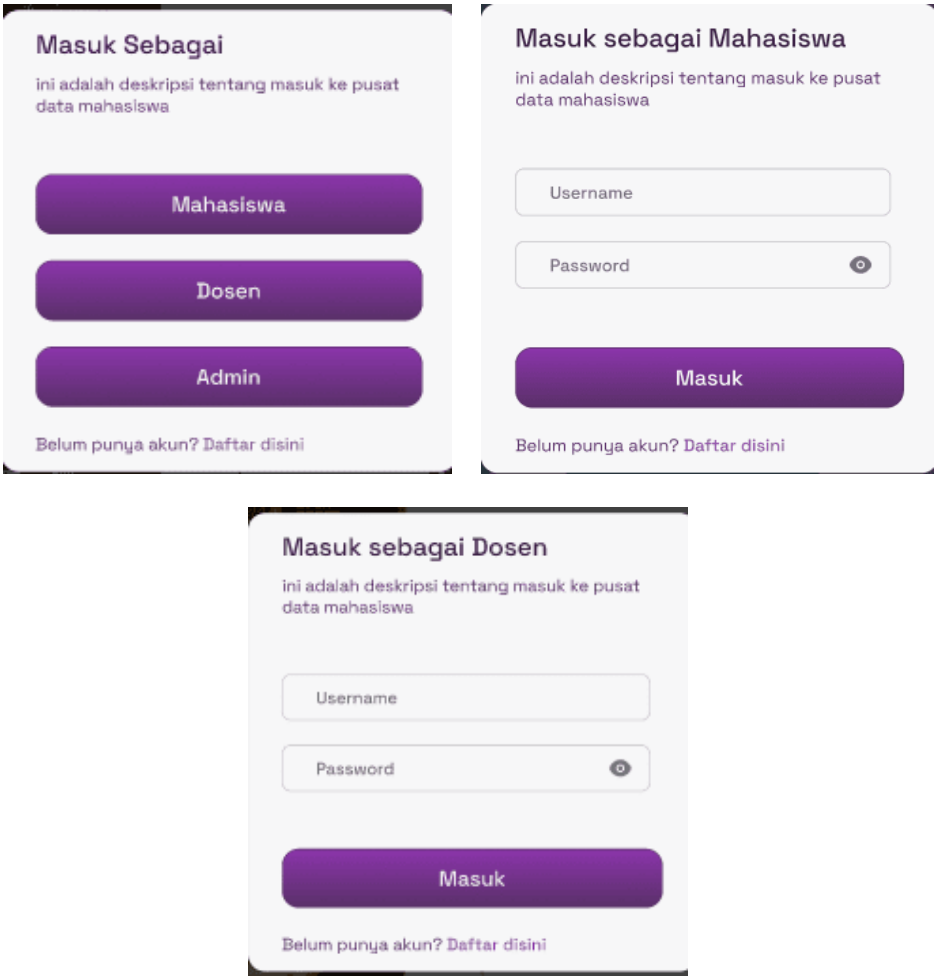
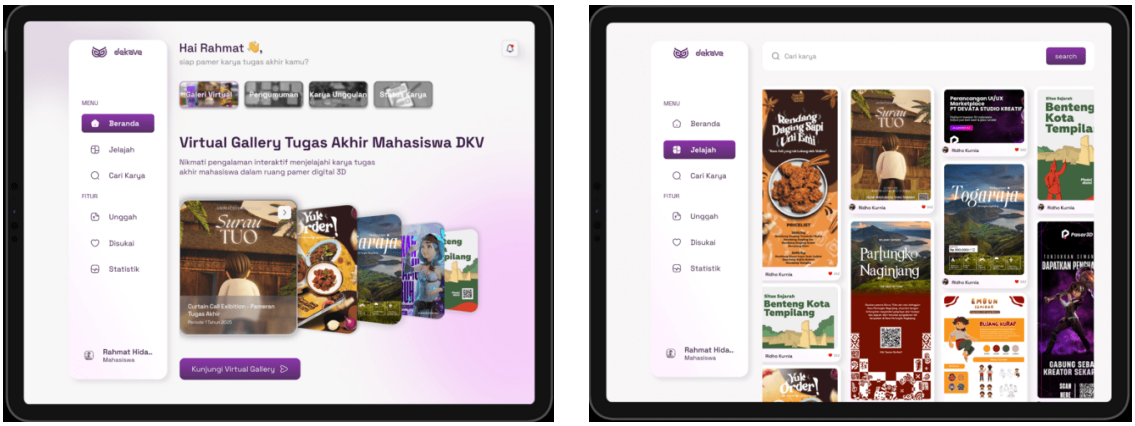


Figure 10. Login and Registration Pages

Figure 10 above illustrates the initial page displayed when users open the user interface (UI) and user experience (UX) application of the student work data center, which directly presents the login and account registration pages. Users who already have an account can easily access the system through the login feature. Meanwhile, new users who do not yet have an account are provided with a registration option by filling out their personal information as required to gain full access to the platform. The login feature can be used by students, lecturers, and administrators.



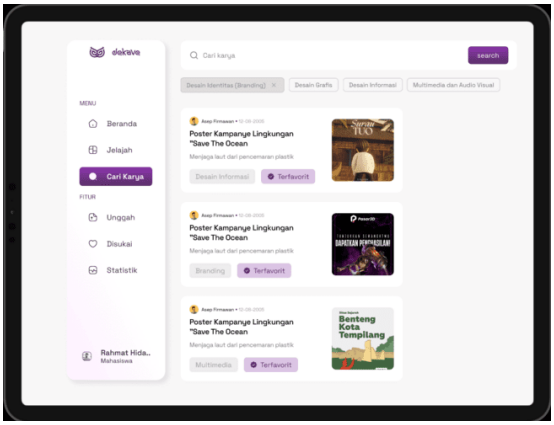


Figure 11. Homepage, Explore, and Work Search Pages

Figure 11. appears when a user successfully logs in with an account registered as a student. Figure 11 consists of the homepage, explore, and work search pages. On the homepage, there are features such as a virtual gallery, announcements, featured works, and work status. The explore page includes a search bar and displays available works, which can be viewed by scrolling left, right, up, or down. The work search page provides a search bar to facilitate finding specific works, including keywords, descriptions, and corresponding images. The layouts of the homepage, explore, and work search pages are similar across administrators, lecturers, and students, with differences only in the available features.

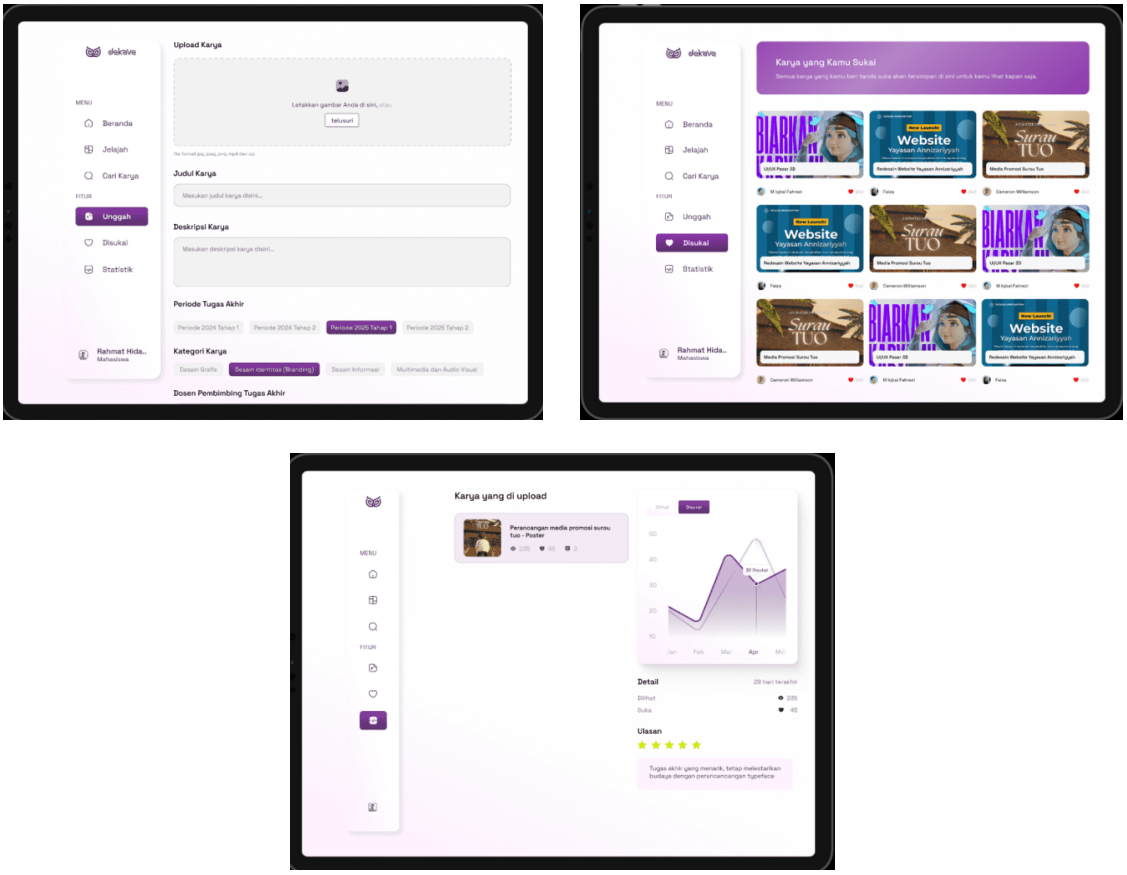


Figure 12. Upload, Favorites, and Statistics Pages

Figure 12 illustrates the interface displayed when users access the upload, favorites, and statistics features. After selecting the upload feature, users are directed to a page

where they can upload their work and fill in details such as the title, description, final project period, work category, and academic advisor. The favorites feature displays the list of works that the user has liked. Meanwhile, the statistics feature presents analytical data regarding the uploaded works, including the number of likes and views, detailed performance metrics, and user feedback or reviews.

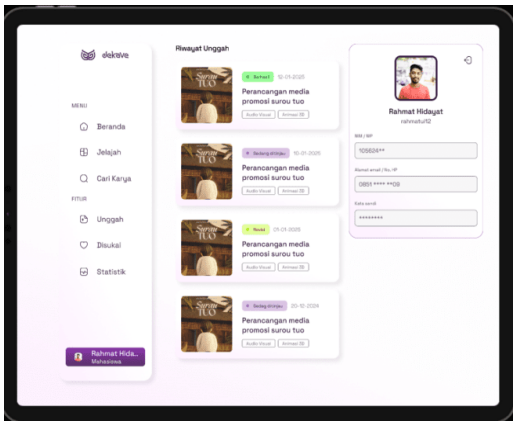


Figure 13. Student Account Page

Figure 13 displays the user account page, which contains the upload history and user profile information such as name, photo, student identification number (NIM), address, password, and a logout icon.

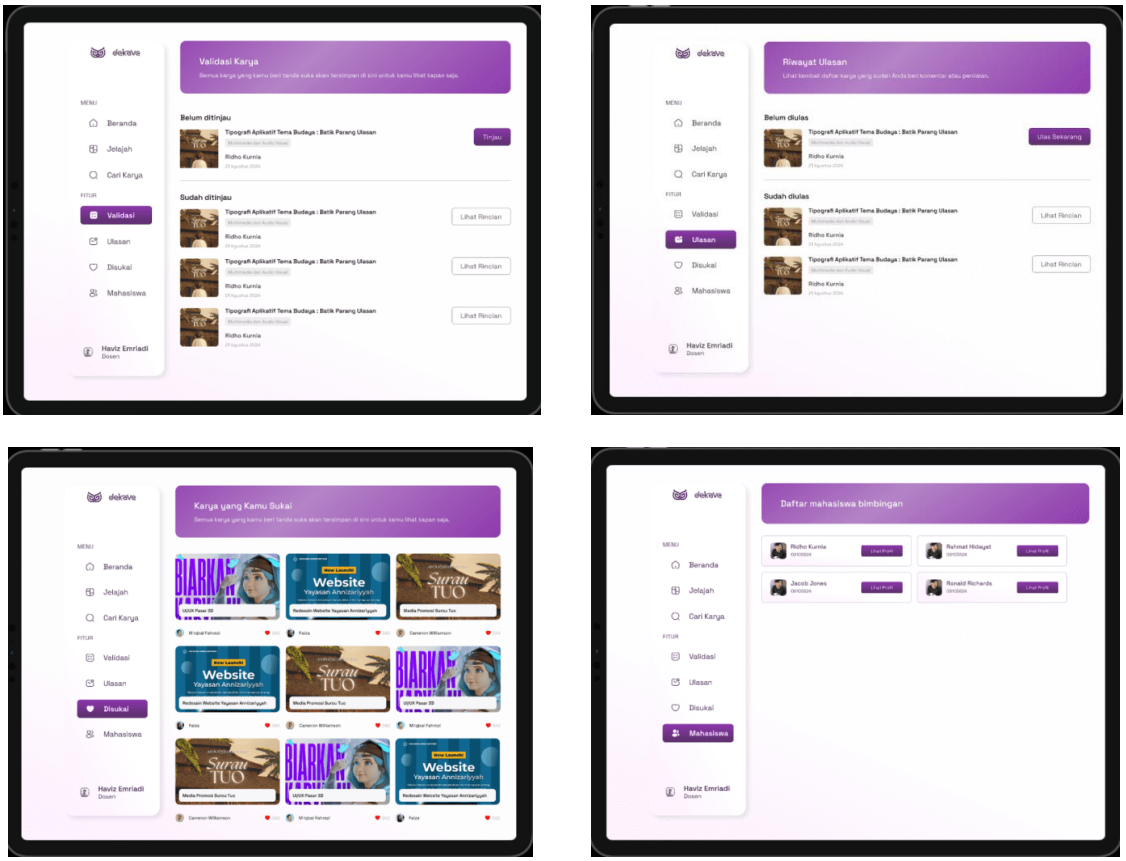


Figure 14. Validation, Review, Favorites, and Student Pages

Figure 14 displays the interface when users access the validation, review, favorites, and student features. After selecting the validation feature, a list of students whose works have been reviewed will appear, along with an option to review supervised students' works by clicking the *Review* button. Once the review button is selected, detailed information about the work is displayed, including *Revise* and *Validate* buttons. The review feature shows both reviewed and pending works, with the option to click *Review Now* for those that have not yet been evaluated. The favorites feature displays the works that the user has liked, while the student feature presents a list of supervised students.

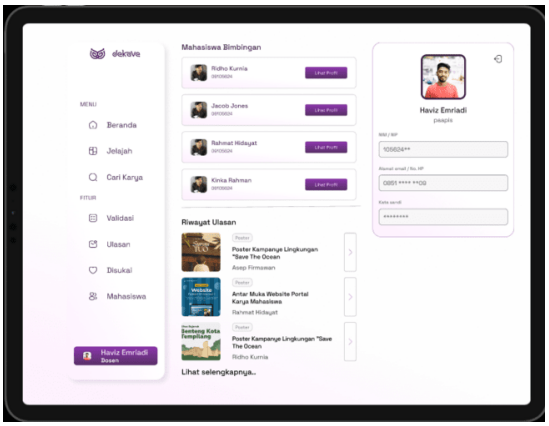


Figure 15. Lecturer User Page

Figure 15 displays the lecturer user account page, which contains information such as the list of supervised students, review history, and user profile details including name, photo, identification number, address, password, and a logout icon.

3.5 Test

At the testing stage, the primary focus was to evaluate the prototype and understand how users interacted with the designed product or system. This process involved usability testing and the measurement of user satisfaction using structured instruments such as the *System Usability Scale* (SUS) and the *Net Promoter Score* (NPS).

Based on the survey results, the average SUS score obtained was 84.8 out of 100, indicating that the system demonstrated a very high level of usability. This score suggests that respondents found the Visual Communication Design (VCD) student work data center system to meet the criteria for ease of use, interface consistency, and effectiveness in completing their tasks.

To assess user loyalty and satisfaction, the *Net Promoter Score* (NPS) was used to measure the likelihood of users recommending the system to others. The results showed that 62.5% of respondents were categorized as *promoters* (scores 9–10), indicating that the majority of users were satisfied and likely to recommend the system. Meanwhile, 37.5% of respondents were categorized as *passives* (scores 7–8), suggesting that they had positive experiences but were not highly enthusiastic about recommending the system. Notably, there were no respondents classified as detractors (scores 0–6), indicating the absence of users who were highly dissatisfied with the system.

Overall, an NPS score of +62.5 signifies that the VCD student work data center system successfully achieved a high level of user satisfaction and holds strong potential for broader acceptance among its target audience.

The usability results indicate that the proposed system achieved a SUS score of 84.8, placing it within the "excellent" usability category. This score demonstrates that the interface design effectively supports task completion, navigation clarity, and visual consistency. Compared to previous studies on academic repositories, which commonly report usability scores in the acceptable range, these results suggest a significant improvement in usability performance.

Furthermore, the NPS score of +62.5 reflects strong user satisfaction and

recommendation potential, indicating that the system not only meets functional requirements but also delivers a positive user experience. This finding is particularly relevant in art-based academic environments, where visual engagement, intuitive interaction, and aesthetic coherence play a critical role in user acceptance and sustained use.

CONCLUSION

This study demonstrates that a Design Thinking based UI/UX approach can effectively enhance the usability and acceptance of a Visual Communication Design student works data center. Rather than functioning solely as a digital repository, the proposed system supports meaningful interaction, visual exploration, and user engagement within an art-based academic environment. The integration of usability-driven design with cultural and visual considerations contributes to strengthening institutional identity and improving user experience quality. Academically, this research provides an empirical reference for UI/UX development in art-oriented academic repositories. Practically, the proposed design model may serve as a guideline for similar higher education institutions seeking to optimize the documentation, curation, and dissemination of student creative works.

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