User Interface and User Experience Testing using the Lean UX method on the UT Course Assignment (TMK) website

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Abstract
Technological developments have driven digital transformation in the world of education, including the use of websites as a medium to support learning. The Open University (UT) provides various online academic platforms, one of which is the Course Assignment (TMK) website, which is intended to support independent learning for students who do not attend tutorials. However, the TMK website still faces a number of complaints regarding its user interface (UI) and user experience (UX) design, which are considered to be unintuitive. Therefore, this study aims to evaluate and improve the quality of UI/UX on the TMK website using the Lean UX approach. The Lean UX method is applied in three main stages: Think, Make, and Check. Data collection was conducted through a USE Questionnaire (Usefulness, Ease of Learning, Ease of Use, and Satisfaction) distributed to 25 UT students. Initial testing results showed a usability rate of 71.44%, while after the redesign, the results improved to 106.44%. These findings indicate that after the redesign, there was a significant positive impact on the TMK website, namely an increase in user ease and user satisfaction with the TMK website. As result, this method is effective in producing a TMK website design that is more responsive, user-friendly, and supports the learning process optimally.

Keywords: Lean UX, User Interface, User Experience, Website TMK, Universitas Terbuka, USE Questionnaire

1. Introduction

Technological developments have always been a new paradigm in endless digital transformation. Currently, almost all parts of the world use technology in their daily lives. This digital transformation has changed traditional manufacturing methods into a digital and integrated world by utilizing the internet and technological infrastructure (Zahra et al., 2024). This digitalization presents challenges and opportunities that are not only about adopting new technology, but also about changing and maximizing the potential of transformation to achieve competitive and sustainable excellence (Hariyono et al., 2024). In the context of education, this digital transformation involves structural innovation in learning models that support inclusivity and adaptability so that they are able to respond to pedagogical demands arising from the development of digital technology (Dorlince O Hutapea et al., 2024).

Various educational institutions, including the Open University (UT), have widely utilized technology in the learning process. Since its inauguration on September 4, 1984, UT has provided various learning support facilities such as varied learning media, flexible learning durations, and independent learning methods (Ridwan et al., 2024). One form of learning support is Coursework (TMK), which is an alternative means that allows students to study independently without having to attend tutorials (Terbuka, 2024). Along with the increasing demand for learning services, it is important to review user experience and satisfaction. According to the journal "User Experience

and User Satisfaction Analysis of Learning Assistance Services (TUWEB, TUTON, TMK) at UPBJJ-UT Bengkulu," as shown in Table 1, the main factors that influence TMK user experience and satisfaction are the novelty and clarity of the service (Mikaresti et al., 2021). Therefore, it would be advisable to develop designs and features that are not only efficient but also innovative in order to increase student satisfaction.

Table 1. TMK satisfaction data in the journal User Experience and User Satisfaction Analysis of Learning Assistance at Bengkulu University

R Square		F		Sig.	
.750		159.147		.000[a]	
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	15.654	1.832		8.547	.000
	X1 (*attractiveness*)	.180	.190	.105	.947	.345
	X2 (*dependability*)	.135	.189	.078	.714	.476
	X3 (*efficiency*)	-.213	.236	-.111	-.904	.368
	X4 (*novelty*)	**.724**	**.236**	**.402**	**3.067**	**.003**
	X5 (*perspicuity*)	**.959**	**.210**	**.584**	**4.572**	**.000**
	X6 (*stimulation*)	-.274	.257	-.163	-1.068	.287

F tabel: 2.150
T tabel: 1.653

Considering these factors, we need a method that can give students satisfaction and comfort when accessing TMK (Ngurah Rangga Wiwesa, 2021). For this study, the researcher used the Lean UX method, an innovative approach that emphasizes rapid iterative design and direct collection of user feedback. It aims to find the fastest way to produce relevant solutions that are oriented towards user needs (Gothelf & Seiden, 2013).

Previous studies that used the Lean UX method. For example, Wijaya and Pakereng, who used the Lean UX method in the Charum Forum Group Discussion Application, showed that Lean UX can increase user satisfaction and improve the overall user experience (A. Wijaya et al., 2024). Others include "Analysis and Design of E-Commerce Application UI/UX Based on the Lean User Experience Model." (Ariyoga et al., 2022) and "Redesign the Ventela Website to Improve User Experience Using Lean UX" (Maidatussohiba et al., 2023) It also yielded significant positive results. That proves that Leax UX can help design a more intuitive user interface (UI) and improve the overall user experience.

For implementation, this study followed the three main stages of the Lean UX method, namely Think, Make, Check. Check is the testing and evaluation stage that focuses on user feedback and research. At this stage, researchers tested the effectiveness of the Lean UX method on the TMK website with usability testing using the USE Questionnaire instrument to measure user satisfaction levels. This research is expected to result in a more innovative TMK website design and provide an optimal interaction experience for users.

2. Research Method

This study adopts the Lean UX method, an approach to design that emphasizes rapid iterative cycles, learning, team collaboration, and direct testing with users (Nanuru et al., 2023). These steps are designed to produce superior design solutions efficiently, while reducing waste of resources and time (Gothelf & Seiden, 2013). Figure 1 below shows the steps taken by the researcher to achieve the objectives of this study.

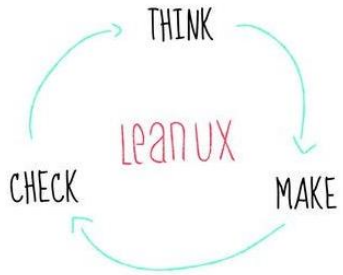

Figure 1. Research Steps

Think

At this stage, it is a process of declaring assumptions, researchers will conduct a series of activities to explore ideas and understand the problems/needs of users regarding the TMK website (Eugenia & Maghfiroh, n.d.). The results of this think stage are to connect the researchers' hypotheses with user needs. These activities include.

User Research

This user research stage aims to gain an in-depth understanding of user needs and problem statements. It consists of surveys/questionnaires, observations, and interviews. Observations will be conducted by gaining a deeper understanding of the TMK website's user interface (Karlina & Indah, 2022). Meanwhile, interviews were conducted with five students who participated in TMK. This stage was carried out to explore the habits of students who use the TMK website and students who use digital products at UT, such as websites and other mobile applications. Outputs from this user research include g-form recaps, user behavior/problems, and user personas.

Brainstorming

During this brainstorming stage, researchers examine ideas, user feedback on the TMK website, and other important data that connect the hypothesis with product requirements and student needs to create a website design framework/sketch (Nadiyah Rahmalia & glints, 2021).

Make

At this stage, the researcher created a user interface/user experience design, namely by creating a wireframe (Purwaningtias & Ulfa, 2024). After creating the wireframe, the researcher continued the framework for creating the TMK website system design. Then, they continued by creating a high-fidelity design with the previously created design system. Of course, the results of this high fidelity use the UX Laws design principles including several components such as layout, typography, color, visual hierarchy, imagery, and affordance (Vlasenko et al., 2022). The next stage, the researcher developed a design prototype using Figma. This application allows researchers to create more detailed interactive prototypes of the designs that have been created.

Check

In this stage, the prototype website created by the research team was tested on 25 Open University (UT) students who had never accessed the TMK website before. The testing was conducted by assessing the user experience when accessing the TMK website and the redesign prototype that had been created. Then, the researchers collected student feedback and tested the feasibility of the design that had been created with a usability test and identified whether the pain points received by users could be solved or not (Rifky Gifari & Awiet Wiedanto Prasetyo, n.d.). The testing tool chosen was Google Forms to measure the success rate of the product using the USE Questionnaire (Usefulness, Ease of Learning, Ease of Use, Satisfaction), each consisting of 16 questions (Ningtiyas et al., 2021). Feedback results will be repeated in a continuous cycle until the expected goals are achieved, as well as outcomes that provide convenience and comfort for students, which can be used as material for future evaluation.

3. Results and Discussions

Think

- ***Observation***

In the Think stage of the Lean UX approach, researchers gathered insights by studying the TMK website. (F. D. Wijaya & Pakereng, 2023). These findings were then integrated with the research objective, which was to develop a website that is easy to understand for students as end users, so that it can be optimally utilized as a learning tool at the Open University. Also at this stage, the researchers examined several points that were outlined in a table of assumptions, as shown in Table 2.

Table 2. Assumptions Table

Assumption
It is believed that students have difficulty finding the login button
It is believed that students want an attractive and flexible UI that will make *users* more interested in exploring *the website*
It is believed that students have difficulty finding the download and upload buttons for assignments.
It is believed that students have difficulty knowing whether their assignments have been uploaded or not

Through analysis of Table 3, researchers developed hypotheses and research questions that were consistent with the research objectives.

Table 3. Table Analysis

Hypothesis	Goals	Research Questions
student registration/login	Create a simple registration display on the TMK website	How to create an easy-to-understand registration interface?
Visual design	Creating a visual design with attractive fonts and colours to enhance the website's appearance	How to create an attractive yet simple interface?
Upload assignment	Creating icons that make it easier for students to find where to download and upload assignments	How to choose suitable icons and layouts so that they are easy for end-users to find?
Pop-up notifications	Creating successful and unsuccessful notifications	What icons and colours are appropriate for creating pop-ups?

- ***User Research Interview***

As part of an in-depth exploratory approach, the next stage of this research involved conducting in-depth interviews with five active TMK users. The objective of these interviews was to gain a deeper understanding of user needs and the problems users encounter when using the TMK website (Hamidli, 2023). The questions are summarized in Table 4 below.

Table 4. Questions

	Questions
Understanding Needs	Why did you choose TMK as a learning service at the Open University?
	Since when have you chosen TMK as a learning tool at the Open University?
	What type of device do you use when accessing the TMK website, and why do you use that device?
Identifying Problems	What are the obstacles you face when using the TMK website?
	How do you explore the TMK website?
	How do you download and upload assignments on the TMK website?

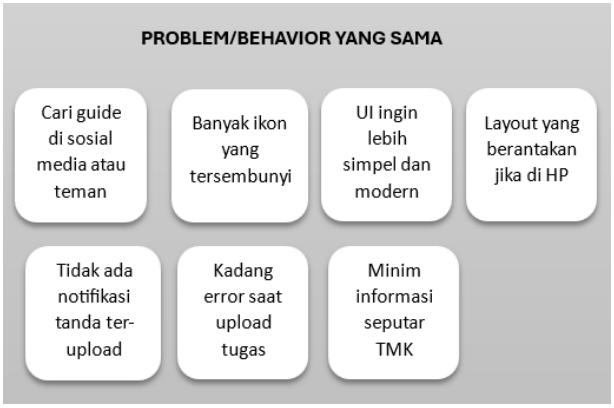

Figure 1. Same Problem/Behavior

Based on the interviews conducted, several similar patterns of behavior and problems were found among users. In Figure 2, the problems that arose included:

a) Difficulty finding guides
b) Many hidden icons
c) UI display that looks rigid
d) Limited information about TMK

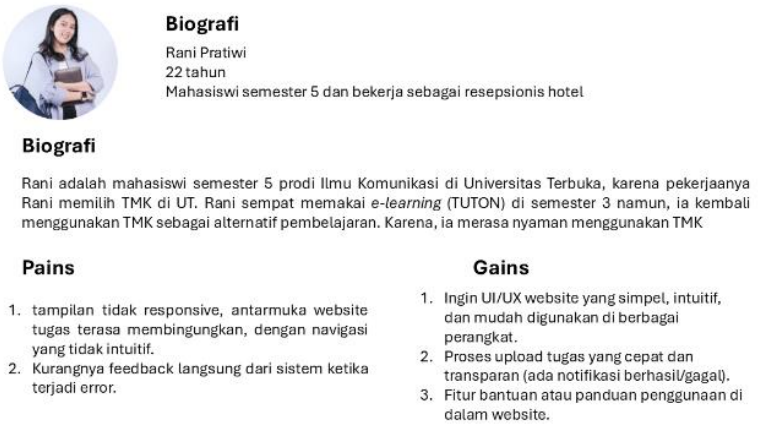

Figure 2. User Persona

Table 5. How Can We Solve

Problem	Solution
Users often find it confusing to explore the website	Create an efficient website
Users often have trouble finding icons	Make icons easy to find
Users find the appearance unattractive	Create a modern design without compromising functionality
Users encounter no upload notifications and errors when uploading tasks	Create notifications for uploads or errors, delete tasks
Users find there is minimal information about TMK	Create a page containing schedule information and details about TMK

Interview results and problem mapping contained in Table 5, resulted in user personas in Figure 3. Furthermore, these will be used as a reference in the prototype design process.

Make

- ***High-Fidelity prototype***

Researchers then created a high-fidelity prototype. This step involved designing an interface that was as close as possible to the final product, adding colors, layouts, and fonts to make it more appealing in terms of visual appearance and interactivity. Figure 4 shows the font and colors used by the researchers.

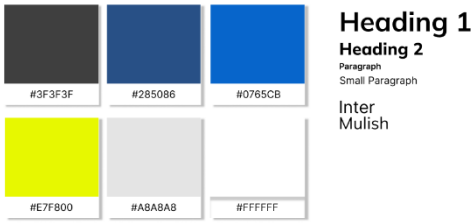

Figure 3. Color Pallete

- ***Login Page Prototype***

This page is the first page users see when they enter the website. Users will be given a choice of categories based on their purpose, namely students, lecturers, proofreaders, and staff. There is also an interactive schedule on the right side that makes it easy for student users to remember assignment deadlines, as well as a forgot password feature if users forget their passwords.

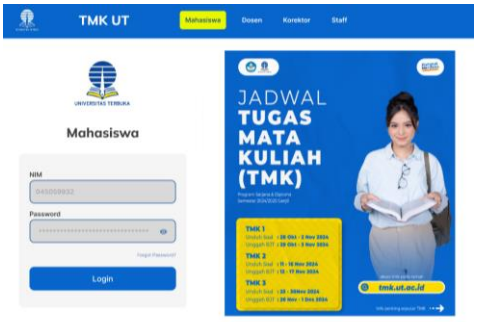

Figure 4. Login Page

- ***Home Page Prototype***

Once the user logs in through the student section, the next page is the dashboard. Figure 6 shows the user's recent assignments and progress in completing them. On the left side of the layout,

there is a menu that users can explore, such as the task list, BJT download, Help, and settings. In addition, there is a login feature located next to the profile.

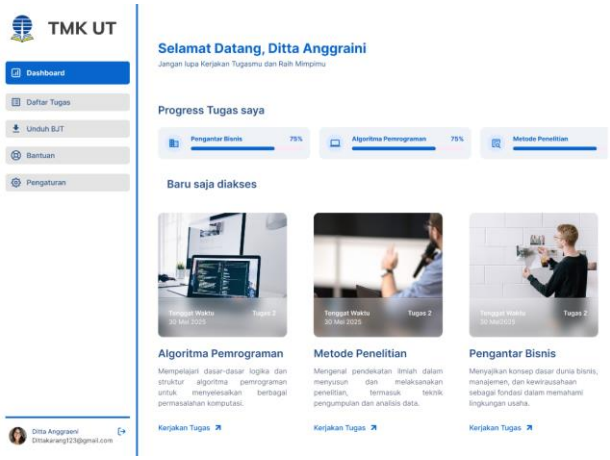

Figure 5. Dashboard Page

Task List Page Prototype

On the next page, which is the assignment list, this page will display all registered courses. Downloading and uploading assignments consists of 3 steps. First, select one of the courses. Second, download the manuscript in the "unduh" section.

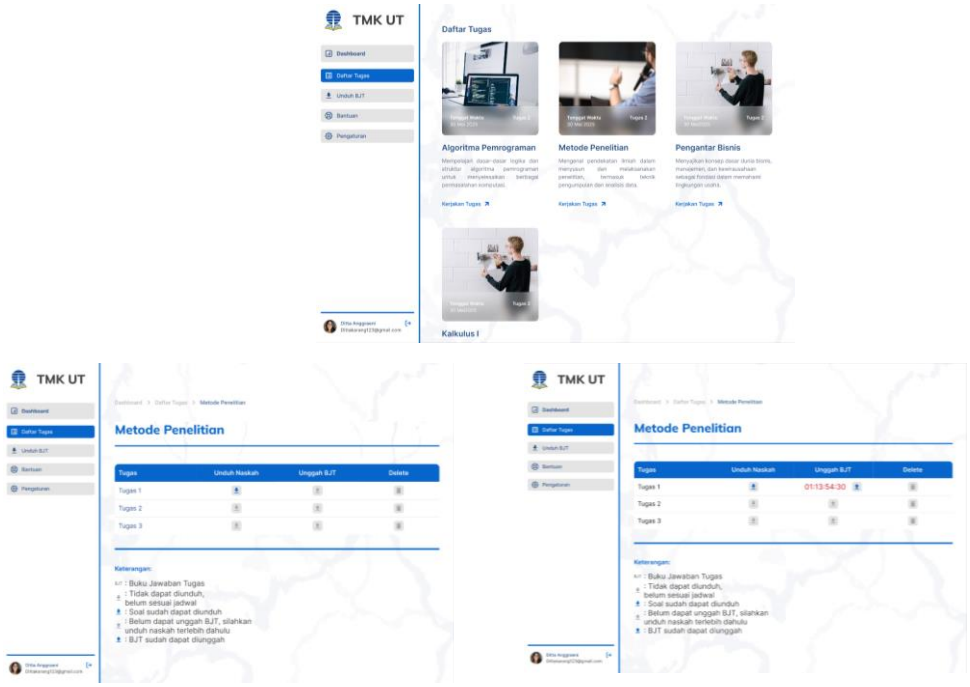

Figure 6. Task List Page

Following that, there are several icons such as download, upload, and delete. If the user has downloaded the assignment, a deadline will appear and there will be a "trash" icon if the user wants to replace a file that has already been sent.

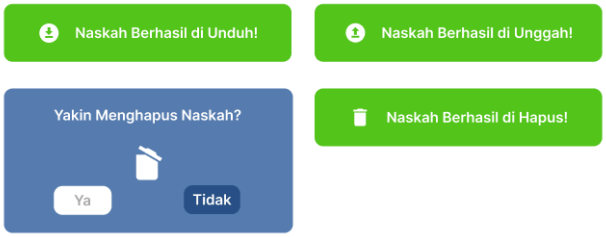

Figure 7. Pop Up Notification

Check

After that, the next step is the Check stage, which is done in two steps, giving 25 UT students who have never accessed the TMK website a chance to do so and then comparing the two groups. This test uses the USE Questionnaire, consisting of 16 questions divided into four factors, namely Usefulness, Ease of Learning, Ease of Use, and Satisfaction, with references cited by Arnold Lund

- ***TMK Website Testing***

Testing was conducted by providing 25 open university students with access to the TMK website, and then giving them a questionnaire consisting of 16 statements as shown in Table 5.

Table 6. TMK Website Testing

No	USEFULNESS	Value	
1	I feel more efficient in completing course assignments on the TMK website.	2,92	
2	The TMK website helps me to be productive.	3,04	
3	The information on the TMK website supports my academic activities.	3,2	
4	The TMK website saves me time when using it.	3,2	
TOTAL *USEFULNESS*		**12,36**	**77,25%**
	EASE OF LEARNING		
5	I can learn the TMK website easily	2,8	
6	I can understand every icon or symbol on the TMK website	2,68	
7	I can easily find every feature I am looking for on the TMK website	2,56	
8	I can find guides or help on the TMK website	2,76	
9	I find it very easy to use the TMK website even as a new user	2,8	
TOTAL *EASE OF LEARNING*		**13,6**	**85,00%**
	EASE OF USE		
10	The features of the TMK website are in line with the needs of students	2,96	
11	I can easily access and upload TMK assignments on the TMK website	3	
12	I feel helped by the website guide when I encounter problems	3,04	

TOTAL *EASE OF USE*		**9**	**56,25%**
	SATISFACTION		
13	I feel satisfied when using the TMK website	2,84	
14	I feel that I will use the TMK website often	2,32	
15	I find it easy to access the TMK website	2,88	
16	I am satisfied with the appearance of the TMK website	2,72	
TOTAL *SATISFACTION*		**10,76**	**67,25%**
	TOTAL	**45,72**	**71,44%**

Based on the results of the questionnaire, it was found that UT students who had never accessed the TMK website as users had problems accessing the TMK website. As seen in the usability measurement in Table 5, the overall calculation resulted in a score of 71.44%. Usefulness and ease of learning scored 77.25% and 85.00% respectively, while ease of use and satisfaction scored 56.25% and 67.25%. Overall, respondents felt that the TMK website could support academic activities, productivity, and features that aid academic learning.

- ***Testing the TMK Website Redesign***

Testing continued with trialing the redesigned TMK website prototype on the same 25 students, and then the students filled out a questionnaire consisting of 16 questions, as shown in Table 6.

Table 7. TMK Website Redesign Testing

USE A	**USEFULNESS**	**Value**	
1	The layout and structure of the pages make it easy for me to navigate.	4,32	
2	This website meets the needs of students in collecting and managing assignments.	4,28	
3	The information on the TMK website supports my academic activities.	4,2	
TOTAL *USEFULNESS*		12,8	80,00%
USE B	**EASE OF LEARNING**		
8	I can understand every icon or symbol on the TMK website.	4,04	
9	I quickly became proficient in using this website	4,08	
10	I find the TMK website very easy to use, even as a new user	4,16	
11	The colors and typography make the content easy to read	4,2	
12	The design helps me learn new functions quickly	4,24	
TOTAL *EASE OF LEARNING*		20,72	129,50%
USE C	**EASE OF USE**		
4	This website is easy to use	4,52	
5	The website interface is simple and not confusing	4,2	
6	I find this website user-friendly I can use it without having to read the manual	4,44	
7	This website is easy to use	4,04	

TOTAL *EASE OF USE*		17,2	107,50%
USE D	**SATISFACTION**		
13	The combination of colors and visual elements is pleasing to the eye	4,28	
14	I feel comfortable and happy when using it	4,08	
15	The design of this website is attractive and modern	4,64	
16	I am satisfied with the overall appearance of the website	4,4	
TOTAL *SATISFACTION*		17,4	108,75%
	TOTAL	**68,12**	**106,44%**

After the redesign, the questionnaire results were positive, with UT students expressing satisfaction with the redesign of the TMK website. Based on the measurements in Table 5, the total score was 105.94%. In terms of usefulness and ease of use, the scores were 80.00% and 107.50%, respectively, while in terms of ease of learning and satisfaction, the scores were 129.50% and 106.75%. The dimension of ease of learning received the highest score, indicating that the TMK website is very easy to learn, even for new users. These results show that, overall, respondents feel that the TMK website is able to support academic activities and productivity, as well as provide features that facilitate the learning process.

4. Conclusion

Table 8. Results of The Lean UX Approach

BEFORE RE-DESIGN				AFTER RE-DESIGN			
USE A	USEFULNESS	12,36	77,25%	USE E	USEFULNESS	12,8	80,00%
USE B	EASE OF LEARNING	13,6	85,00%	USE F	EASE OF LEARNING	20,7	129,50%
USE C	EASE OF USE	9	56,25%	USE G	EASE OF USE	17,2	107,50%
USE D	SATISFACTION	10,76	67,25%	USE H	SATISFACTION	17,4	108,75%
	TOTAL	45,72	71,44%		TOTAL	68,1	106,44%

Based on the results of the analysis in Table 8, the application of Lean UX shows high effectiveness in optimizing the quality of the user interface and user experience on the Open University Coursework (TMK) website. Compared to the initial test with an average score of 71.44% and after the redesign to 106.44%, this proves that there has been an improvement in all aspects of usability, especially in the Ease of Learning dimension, in the question “I find it very easy to use the TMK website if I am a new user” which increased from 2.8 to 4.16. This indicates that the new design is easier to understand, even for new users. The increase in scores for Usefulness, Ease of Use, and Satisfaction also reflects the success of the design in meeting user needs.

Overall, the Lean UX approach has proven to be capable of improving design quality iteratively through problem identification, solution development, and continuous evaluation.

These findings are expected to serve as a reference in designing and developing more adaptive and responsive digital learning platforms at the Open University and other educational institutions.

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We would also like to thank the students of the Open University who participated as interview sources and questionnaire respondents.Their contributions in sharing their experiences and perspectives on the use of TMK greatly enriched our understanding of the UI/UX aspects of the TMK website. From these critical opinions and through the Lean UX approach, we successfully designed an iterative and user-need-based re-design prototype. Last but not least, we would like to express our gratitude to all parties who supported the smooth running of the prototype design process and the preparation of the final report. Although we received official information about the discontinuation of TMK at the Open University in the middle of this research, it did not hinder the completion of this study. we hope that this valuable opportunity will not only benefit the TMK website but also have a positive impact on the development of knowledge in the field of digital learning at the Open University.

Referance

Hutapea, D. O., Sidebang, D. D., Lumban Gaol, R. S., & Yunita, S. (2024). Analisis transformasi digital dalam pendidikan dan implikasinya terhadap masa depan. *Cendekia: Jurnal Ilmu Sosial, Bahasa dan Pendidikan, 4*(3), 101–106. https://doi.org/10.55606/cendekia.v4i3.2978

Eugenia, M. P., & Maghfiroh, L. R. (n.d.). *The Lean User Experience (Lean UX) approach in the redesign of the SOBAT BPS application*. https://mitra.bps.go.id

Gothelf, J., & Seiden, J. (2013). *Lean UX: Applying lean principles to improve user experience*. https://www.hostedredmine.com/attachments/download/80950/Lean%20UX%202013.pdf

Hamidli, N. (2023). *Introduction to UI/UX design: Key concepts and principles*. https://www.academia.edu/98036432

Hariyono, S., Iwan, A., Candra, F., Mauliansyah, S. I., Wahyudin, Y., & Rizal, M. (2024). *Transformasi digital: Teori dan implementasi menuju era Society 5.0*. Sonpedia. https://www.buku.sonpedia.com

Karlina, D., & Indah, D. R. (2022). Perancangan user interface dan user experience sistem informasi e-learning menggunakan design thinking. *Jurnal Teknik Informatika dan Sistem Informasi, 8*(3). https://doi.org/10.28932/jutisi.v8i3.5412

Maidatussohiba, E., Maarij, M. N., Pratama, B. W. P., Lisnorviona, M. D., & Pratama, K. A. K. (2023). Redesain website Ventela untuk meningkatkan user experience pengguna menggunakan Lean UX. *ETNIK: Jurnal Ekonomi dan Teknik, 2*(11), 1056–1069. https://doi.org/10.54543/etnik.v2i11.262

Mikaresti, P., Yusrizal, Y., & Nurmalia, A. (2021). User experience and user satisfaction analysis of learning assistance services (Tuweb, Tuton, TMK) at UPBJJ-UT Bengkulu. *Jurnal Kependidikan: Jurnal Hasil Penelitian dan Kajian Kepustakaan di Bidang Pendidikan, Pengajaran dan Pembelajaran, 7*(4), 981–989. https://doi.org/10.33394/jk.v7i4.4141

Rahmalia, N., & Glints. (2021, August 17). Lean UX, konsep yang mampu tingkatkan efektivitas proses desain. https://glints.com/id/lowongan/lean-ux-adalah/

Nanuru, F. G., Tuhuteru, H., & Nivaan, G. V. (2023). The implementation and integration of UI/UX design within the Joobify application through the utilization of the Lean UX methodology. *JINAV: Journal of Information and Visualization, 4*(2), 243–251. https://doi.org/10.35877/454RI.jinav2461

Ningtiyas, A., Faizah, S. N., Mustikasari, M., & Bastian, I. (2021). Pengukuran usability sistem menggunakan USE questionnaire pada aplikasi OVO. *Jurnal Ilmiah Komputer dan Sistem Informasi*. https://doi.org/10.32409/jikstik.20.1.2701

Purwaningtias, F., & Ulfa, M. (2024). Desain UI/UX website menggunakan metode Lean UX. *Journal of Information Technology Ampera, 5*(1). https://doi.org/10.51519/journalita.v5i1.589

Ridwan, M. Y., Maulana, M. R., & Nurdiana, D. (2024). Usability testing website MyUT menggunakan metode post-study system usability questionnaire berdasarkan pandangan mahasiswa Universitas Terbuka. *Jurnal Sistem Informasi dan Informatika (Simika), 7*(2), 207–222. https://doi.org/10.47080/simika.v7i2.3389

Gifari, M. R., & Prasetyo, A. W. (n.d.). Perancangan website penjualan dengan metode Lean UX dan user experience questionnaire. *18*(2).

Maulana, R. M., Utama, M. R. P. A., & Nurdiana, D. (2023). Uji usability dan user experience website sistem informasi akademik Universitas Terbuka (SIA UT) berdasarkan perspektif mahasiswa menggunakan metode USE questionnaire dan cognitive walkthrough. https://doi.org/10.32493/jtsi.v6i3.34189

Wiwesa, K. N. R. (2021). User interface dan user experience untuk mengelola kepuasan pelanggan. *Jurnal Sosial Humaniora Terapan, 3*(2). https://scholarhub.ui.ac.id/jsht/vol3/iss2/2

Universitas Terbuka. (2024, July 22). *Tanya minUT: Apa yang dimaksud dengan tugas mata kuliah (TMK)?* https://www.ut.ac.id

Vlasenko, K. V., Lovianova, I. V., Volkov, S. V., Sitak, I. V., Chumak, O. O., Krasnoshchok, A. V., Bohdanova, N. G., & Semerikov, S. O. (2022). UI/UX design of educational online courses. *CTE Workshop Proceedings, 9*, 184–199. https://doi.org/10.55056/cte.114

Wijaya, A., Al Fauzan, M. F., Syakti, F., & Putra, M. S. (2024). Implementasi metode Lean UX user interface dan user experience pada aplikasi forum group discussion Charum. *Jurnal Teknologi dan Sistem Informasi Bisnis, 6*(4), 732–745. https://doi.org/10.47233/jteksis.v6i4.1034

Wijaya, F. D., & Pakereng, M. A. I. (2023). Perancangan aplikasi e-commerce FDW Store menggunakan metode Lean UX. *Jurnal JTIK (Jurnal Teknologi Informasi dan Komunikasi), 7*(2), 337–347. https://doi.org/10.35870/jtik.v7i2.817

Zahra, A., Agustini, T. D., Andari, A. S. M., & Rachman, I. F. (2024). Transformasi digital di masyarakat desa: Tantangan dan peluang menuju terwujudnya SDGs 2030. *Jurnal Masyarakat dan Ilmu Administrasi, 1*(3), 93–99. https://doi.org/10.61722/jmia.v1i3.1364