

Research Article

UI/UX Textbook Development Using ADDIE and E-learning in the Multimedia Study

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Abstract.

Education at colleges is frequently discovered to be independent, therefore learning managed may differ from materials taught. UI/UX is an important topic in multimedia. This study aims to create a learning system that is integrated with educational publications based on UI/UX courses. Agile is the strategy used to design the learning system, and ADDIE is the method used to develop educational materials. Every level of development and education is carried out simultaneously, beginning with planning and design, followed by implementation, and ending with evaluation. The research collaborator is PT. Impactbyte of Educational Technology. The findings from the assessment conducted on the production of textbooks indicate that students exhibit a favorable response toward the generated textbook. Additionally, the evaluation of eLearning, carried out through black-box testing, demonstrates that all the implemented functionalities perform effectively.

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Published 7 March 2024

Publishing services provided by
Knowledge E

Keywords: addie method, e-learning, textbook

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Selection and Peer-review under the responsibility of the JICOMS Conference Committee.

1. INTRODUCTION

Science is in a state of constant evolution and change. There is a requirement for schools to consistently enhance their knowledge in order to cultivate graduates who possess the necessary competence and preparedness to confront the demands of the professional sphere. The rationale for this is that institutions of higher education possess the capacity to provide a superior standard of instruction that aligns with the specific demands and requirements of the professional sector. One of the notable advancements in education is the implementation of remote learning, also referred to as e-learning[1], [2]. E-learning refers to the utilization of digital technology to advance scientific knowledge and understanding. However, it is not advisable to solely rely on e-learning as the primary mode of education. Textbooks or other carefully selected books also hold significant value in the learning process. A textbook is a scholarly resource composed by subject matter authorities in their respective disciplines. This resource facilitates students in

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acquiring up-to-date knowledge regarding advancements in scientific progress within a specific discipline. The integration of textbooks and e-learning platforms facilitates the assimilation of scientific knowledge imparted by educators, hence enhancing students' learning experience[3].

There is an important connection between the advancement of e-learning and the utilization of textbooks. E-learning refers to an educational system that makes use of information and communication technology (ICT) to facilitate teaching and learning activities. In contrast, a textbook is a meticulously organized and pedagogically designed resource intended to facilitate students' comprehension of educational content. E-learning has the capability to utilize textbooks as educational resources[4], [5]. The process of digitizing textbooks allows for internet accessibility by students. This feature facilitates convenient access to textbooks for students, enabling them to retrieve them at any time and from any location.

Polimedia is an educational institution that focuses on vocational training, aiming to integrate the benefits of e-learning with traditional textbooks. During the course of our observations in the field of multimedia engineering technology, it was identified that several courses exhibited suboptimal utilization of e-learning resources. Furthermore, the regulations pertaining to incomplete e-learning materials are accompanied by the issue of textbooks that deviate from established norms, resulting in suboptimal lecture experiences. Hence, the researchers intend to develop a cohesive e-learning platform that incorporates pre-existing textbooks, with a particular emphasis on UI/UX course investigation.

2. METHODOLOGY/ MATERIALS

Polimedia is an educational institution focused on vocational training, aiming to integrate the benefits of e-learning and traditional textbooks. In the context of the multimedia engineering technology study program, our observations revealed suboptimal utilization of e-learning in several courses[6], [7]. Furthermore, the regulations pertaining to incomplete e-learning materials are accompanied by the disadvantage of textbooks that deviate from standard procedures, resulting in suboptimal lecture experiences. Hence, the researchers intend to develop a cohesive e-learning system that incorporates pre-existing textbooks, with a specific emphasis on UI/UX course investigation[8].

2.1 Methods for Developing a Learning Portal for UI/UX Courses

The study approach applied the Agile Development method for the system development of learning portals[9]–[11]. The development phase within the agile development

methodology is structured into four distinct components, namely: 1) planning, 2) design, 3) implementation, and 4) evaluation[7]. This distinction can be visually represented as depicted in Figure 3 :

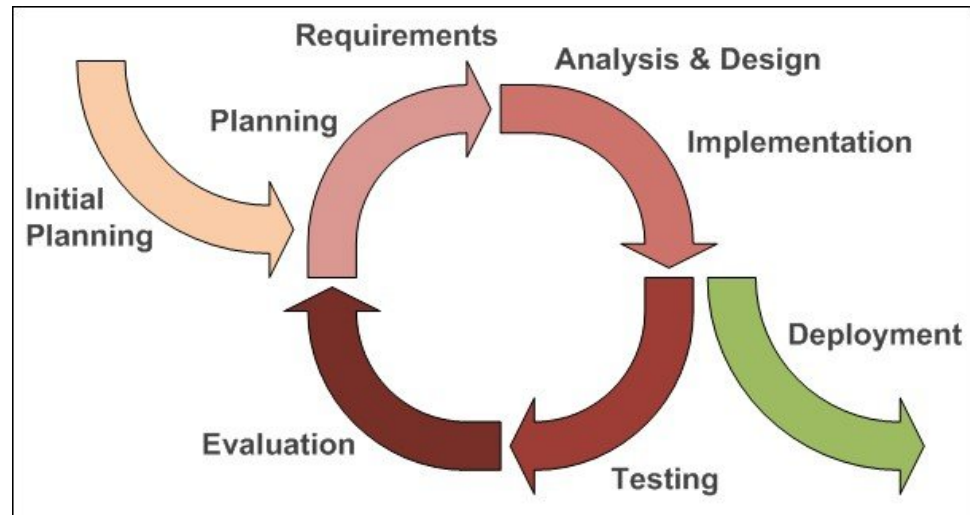


Figure 1: Agile Method Development.

Planning

The initial phase of the planning process starts with a thorough examination and observation of the designated study site. The purpose of the observation is to get insight into the challenges, needs, and desired functionalities associated with the development of the learning portal that is being constructed. A literature review is also undertaken to provide assistance for the development of the system.

Design

During this phase, the outcomes of the observation will be transformed into a design that will be further developed using the Unified Modified Language (UML). This stage encompasses an implementation guide that delineates the comprehensive procedure of constructing the learning portal, with the aim of generating the ultimate result that will be attained subsequent to the culmination of the research endeavor.

Implementation

During this phase, the design outcomes are translated into programming code to facilitate the implementation of the design into a finalized product, which can then be utilized by end-users, specifically students.

Testing

The final phase includes the process of testing and evaluation. Blackbox testing is employed to conduct the testing process, enabling comprehensive examination and validation of each component and feature of the constructed learning portal..

2.1. Methods for Developing a Textbook for UI/UX Courses

The textbook development approach employed is the ADDIE process, which covers the stages of Analysis, Design, Development, Implementation, and Evaluation[11], [12]. At each successive level of the sequential process, the output is concurrently present and functions as the input for the subsequent step[13].

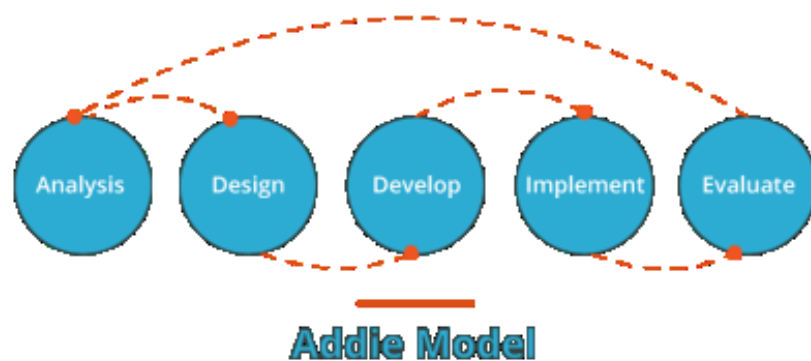


Figure 2: Addie Method.

Secara rinci metode dapat dilihat seperti yang ada dibawah ini:

Analysis

This stage can be interpreted as the initial process taken as a result of the evaluation of existing teaching materials, so that the analysis of the existing problems can be carried out. At this stage, an analysis of the students is also carried out.

Design

In this stage, there are several activities, including:

Studying the core competencies and basic competencies in determining learning materials that can be referred to from concepts, principles, and learning procedures

Designing learning scenarios

Development

In this stage, the teaching materials that have been designed can be developed by creating or revising teaching materials so that the best teaching materials will be used to achieve learning objectives.

Implementation

In this stage, the teaching materials that have been made are implemented with students in a real-life situation in the classroom. At this stage, the initial evaluation results are also collected from student feedback.

Evaluation

In the last stage of this method, the evaluation is carried out by formative evaluation, which can be carried out every time a UI/UX course is completed.

3. RESULTS AND DISCUSSIONS

The findings derived from this study are categorized into two distinct groups: the production process of textbooks and the resultant textbooks themselves. The preceding phase has provided an elucidation of the evolution of textbooks, yielding educational materials that are now suitable for classroom implementation.

3.1. Textbook Development

The outcomes of the analysis and design of the textbook contents list are presented in the table provided below:

During the developmental phase, the textbook has been included into the e-learning system for instructional purposes. In the realm of e-learning, the educational content that has been created in the form of a traditional textbook can also be accessed via e-learning platforms, supplemented with interactive activities

3.2. Elearning System Development

During that specific phase, the current state of e-learning development is focused on doing a need-analysis. Simultaneously, the analysis phase aims to fulfill the requirement of creating an integrated e-learning platform that complements the existing textbooks. The necessity of including e-learning in this study can be elucidated via the utilization of the table presented herein. During the developmental phase, the textbook has been included into the e-learning system for instructional purposes. In the realm of elearning, the educational content that has been created in the form of a textbook can also be conveniently accessed via elearning platforms, supplemented with interactive activities:

From the needs of the design phase continued so that the integrated elearning can be used by students.

The given image demonstrates that each chapter contained within the physical textbook will possess an identical appearance to its corresponding counterpart within the e-learning platform, and vice versa.

TABLE 1: Book Outline.

| Bab | Sub Bab |
|-------------------------------|---|
| Bab 1: Pendahuluan | Pengertian UI dan UX |
| | Perbedaan UI dan UX |
| | Pentingnya UI dan UX |
| | Ruang lingkup UI dan UX |
| | |
| Bab 2: Karakteristik Pengguna | Pengertian karakteristik pengguna |
| | Jenis-jenis karakteristik pengguna |
| | Metode penelitian pengguna |
| | Analisis data penelitian pengguna |
| Bab 3: Dasar-Dasar Desain | Pengertian desain |
| | Elemen-elemen desain |
| | Prinsip-prinsip desain |
| Bab 4: Proses Desain UI/UX | Tahapan proses desain UI/UX |
| | Metode-metode desain UI/UX |
| Bab 5: Desain UI | Pengertian desain UI |
| | Elemen-elemen desain UI |
| | Prinsip-prinsip desain UI |
| Bab 6: Desain UX | Pengertian desain UX |
| | Elemen-elemen desain UX |
| | Prinsip-prinsip desain UX |
| Bab 7: Prototyping | Pengertian prototyping |
| | Tujuan prototyping |
| | Jenis-jenis prototyping |
| | Proses prototyping |
| Bab 8: Usability | Pengertian usability |
| | Faktor-faktor yang mempengaruhi usability |
| | Pengujian usability |
| Bab 9: Studi Kasus | Pengertian studi kasus |
| | Tujuan studi kasus |
| | Metode studi kasus |

TABLE 2: Requirements Analysis.

| No | Activity | Functional Requirement |
|----|---------------------------|---|
| 1 | Managing Data E-learning | System possesses the ability to add, modify and delete the information of E-learning Data |
| 2 | Managing Topic E-learning | System possesses the ability to add, modify, and delete the information of Topic |
| 3 | Managing Users | System possesses the ability to add, modify, and delete the information of Users |

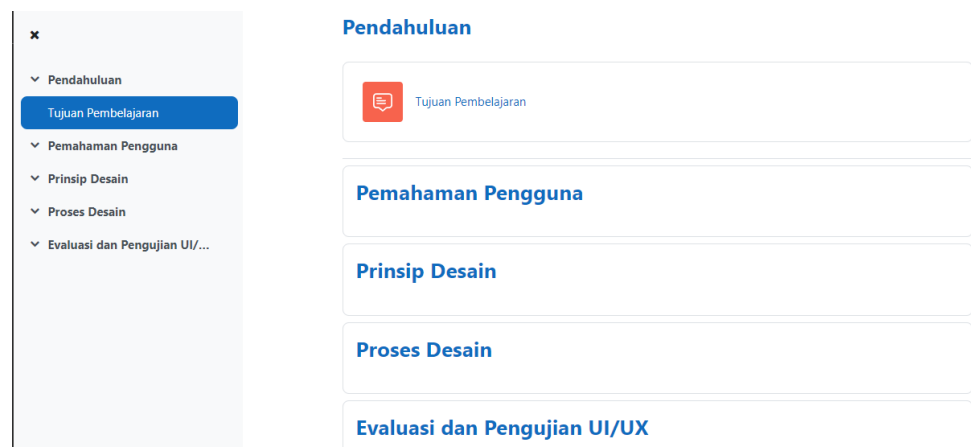


Figure 3: Elearning Dashboard.

3.3. Text Book Evaluation

The method of assessment employed by students to evaluate the textbook is classified as a formative evaluation. The assessment is administered upon completion of the textbook, and inquiries pertaining to the user interface/user experience (UI/UX) textbook are posed. The responses provided by the students will be analyzed to perform an analysis that will inform the future development of the textbook.

3.4. Elearning Evaluation

The evaluation of eLearning is conducted through the application of blackbox testing, wherein the functionality of each component is identified in order to align it with the preferences and requirements of the user.

TABLE 3: Text Book Evaluation.

| Aspect | Questions | Answer |
|-----------------------------|---|--|
| Relevance to curriculum | Is the material presented in the textbook in line with the curriculum? | Adequate but the exercises are not in-depth enough with the actual learning Very relevant because it is very relevant to the semester's lectures |
| Relevance to student needs | Is the material presented in the textbook in line with the students' needs? | Adequately in line with the students' needs |
| Difficulty level | Is the difficulty level of the material presented in the textbook in line with the students' abilities? | Difficult because it requires an understanding of the basics of UI/UX that we did not get in school |
| Readability | Is the textbook easy to read and understand? | Adequately easy to understand Very easy to understand |
| Completeness of information | Does the textbook provide complete and informative information? | Very informative because it has illustrations that are relevant to the topics discussed in the textbook |
| Quality of presentation | Is the textbook presented in an interesting and interactive way? | The language is not standard, making it difficult for students to understand all the languages that have never been discussed. |

TABLE 4: Elearning Evaluation.

| Function | Input | Output | Status |
|-----------------|---|--|---|
| Login | Username and password | Successful login or failed login | Valid username and password |
| Registration | Name, email, phone number, and password | Successful registration or failed registration | All registration data filled in correctly |
| Material search | Title or keyword | Material search results | Searching for material with a valid title |
| Rating | Score | Successful rating or failed rating | Providing a valid rating |

4. CONCLUSION AND RECOMMENDATION

The development, testing, and assessment phases are implemented to ensure the optimal functionality and effectiveness of textbooks, as well as their seamless integration into e-learning platforms, in order to attain educational objectives. The findings from the assessment conducted on the production of textbooks indicate that students exhibit a favorable response towards the generated textbook. Additionally, the evaluation of eLearning, carried out through blackbox testing, demonstrates that all the implemented functionalities perform effectively.

In our recommendation, we propose conducting more study to assess the efficacy of UI/UX textbooks that have been designed utilizing the ADDIE model and e-learning approaches.

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