

Difficulties and Issues Instructional Designers Face in Interactive E-Book Production Process

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Abstract

Background: Web as an instructional medium became more common. This e-learning provides anytime accessible media and resources for learners. Textbooks, the most basic learning items, are converted into e-book format appropriate with the digital age. The learners get involved with the learning process via interactive applications of e-books. The background of this study consists of ADDIE instructional design. ADDIE is utilized to determine the issue and figure out possible solutions. First, e-book will be defined. Then, e-book properties and interaction types are discussed. The issues are clarified based on the experiences of the designers. **Objective:** The purpose of the current study is to determine the issues faced in production process of the e-books. **Results:** Publication platform, development area, typesetting, time management, bias, team work and other issues are basic topic in interactive e-book design process. These issues are presented according instructional designers overview. **Conclusion:** In conclusion, recommendations for solutions are presented about issues. Interactivity in any e-book and decision of instructional design is important assignment for create efficient learning.

Keywords: Interactive e-book, instructional design, e-book production process, e-book design

1. Introduction

There are several opportunities formed for individuals by digital age as computer and internet technology develop and spread. The advances in web technology provide virtual media for individuals to communicate. Interaction could be continued further densely besides face-to-face one. Interaction as a concept gains new dimensions with the emergence of the digital age.

Accessing knowledge and information anytime and anywhere is defined as asynchronous learning. In this approach, learner is in the center. Distance education tools are utilized for simplifying the sharing of information without time and space limitations (Hiltz & Goldman, 2004). Web 2.0, symbolizing the well-developed age of web technology, services rich experiences (O'Reilly, 2005).

Learning transfers from classical classroom to virtual environment. This resulted in changes in teaching strategies (Bertrand, 2003). In developing new technologies, not only Web based but also mobile methods take place. As the mobile devices become more common, the mobility concept spreads. The mobility arises from the factors of being at different places at different times, and a life combined with technology. There are increases in lifelong learning possibilities by accessing to information and knowledge without time and space limitation.

Increase in interaction, developments in technology and richness in mobile media affected the education capabilities.

Teaching courses via Learning Management Systems helped the learners with attending classes from further distances. There is an increase for demand of less published and more online resources (Bates, 2005). Similarly, virtual classrooms are also established.

Among the content served to the learners, books are the first. Books are the primary and basic resource materials both at face-to-face and distance educations. In parallel to the developments of Internet and mobile media, reading books in digital media has been discussed.

There are two basic issues to discuss the existence of the books in digital media. The first one is version of the transportable digital document format formed from the published book. The second one is in addition to making the book digital, the addition of the interactions digitally where the interactions were non-existing ones in the case of the published book.

2. Background

Production of content suitable for the e/learning media is an important topic. There are several issues such as target segment, the properties of the materials to be produced, the functionality of the materials in mobile and web media, the tools needed in development process. Teaching design in determining the problems in the production process of the materials forms the basis of this study. In the current contribution, ADDIE model, a teaching design model, is evaluated.

2.1. Instructional Design Model ADDIE

Among different teaching design models, ADDIE model is the most frequently used one in the literature. ADDIE has five steps of Analysis, Design, Development, Implementation and Evaluation. The ADDIE instructional design model is actually an Instructional Systems Design (ISD) model (Morrison, Ross, Kemp, & Kalman, 2010). Figure 1 shows relationships among elements (Gustafson & Branch, 2002).

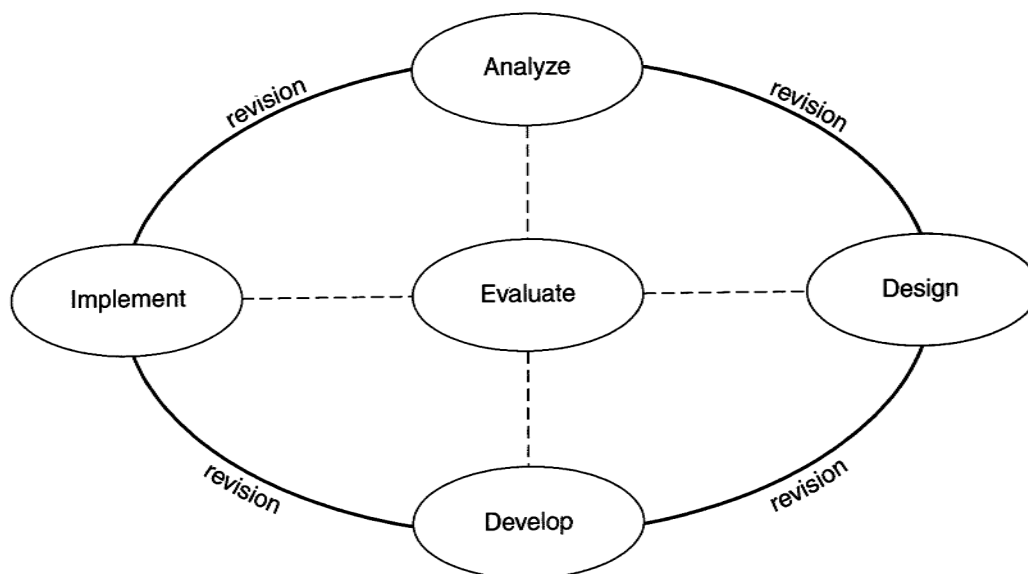


Figure 1: Elements of Instructional Design (ADDIE)

Analysis: This step decides which components need to be in the system, the needs for the systems. For a better design, analysis has significance. The failure in analysis might cause problems in further steps. For this reason, prior to the design of an interactive book the basic titles such as decision of the needs, selection of proper content for the target segment, the determination of the teams need to be discussed in this step. The answers of who will use the product? What will be in the contents? Who will be in the team? Type questions are sought in this section (Gillani, 2003).

Design: In this step, the correlations of the titles of the previous step are linked to the other components of the system. Bringing the components together and determining the relationship between the components are done in this step as preparation for the production process. Design is a step directly related to the production process.

During the stage of design, the instructional designers need to collaboratively with the team focusing on learning tool production. Thus, the production of the designed work packages could be done faster.

Development: In this step, the product emerges. Development is the densest step. The collaboration of different working teams gets faster in this step. Animation, graphic, texts, exercise, test and similar tools are installed together by different working groups of the production. Development is an important step to follow, and it needs to be suitable to the decisions taken in Design.

Implementation: This is considered as a step presenting the product within the frame of instructional strategies. The learning material for the learner is transferred to the suitable communication channel. Based on the target, the files are loaded to either Web sites or mobile devices. Implementation is evaluation of the Development step.

Evaluation: This step deals with each stage of the production process. It is necessary to control the process from design to implementation, and to employ the essential steps. Evaluation in this regard is a serious step for the whole production process. The goal of the instructional design is to depict effective, efficient, attractive, and continuous design. In order to achieve this goal, there is always a need for evaluation to control each step, and the relationships between the different steps. Running the evaluation properly will guide the instructional design to the success.

An interactive e-book, as an instructional material, has significance for showing the importance of production process.

3. Problem Statement

The current contribution focuses on the design of an interactive e-book as an instructional material. The designers involving with process design and management are one of the most elements of the system. For this reason, defining the possible challenges of these designers and providing possible solutions to these issues will help with producing effective, efficient, attractive and continuous interactive e-book. In this regard, the basic question of the current report is the following:

What are the issues instructional designers face during the production process of interactive e-book?

4. Purpose

The purpose of this study is to show the possible issues and solutions to them that instructional designers face during interactive e-book production. For that purpose, the experiences of the instructional designers are evaluated. There are two aims: to contribute to the literature and to inspire the people working in the area.

5. Interactive E-Book as Instructional Material

The transfer from published textbooks to e-books was initiated by the Gutenberg project (Lebert, 2009). The process of converting the published textbooks to digital ones became more common. The digital process allowed the access of the e-books without time and space limitations. An e-book is similar to a traditional story book in a few ways and they have same characters (Anderson-Inman & Horney, 1997; Vassiliou & Rowley, 2008). E-books has traditional book parts, such as a table of contents, chapters and pages (Roskos, Brueck, & Widman, 2009). The basic differences of e-books are flexibility due to being digital. The digitally loaded content could be presented in different media. For this reason, which format and properties the e-books will have needs further discussion.

5.1. E-book Formats and Properties

There is the issue of how the book converted into digital format will be presented. E-book producers and publishing houses market their own file types. The most common e-book formats and file types are DjVu, ePUB, HTML, iBook, PDF, MOBI, TXT, XML, respectively. The variety of these formats provides various options for the users, but causes issues as well. Any user purchasing e-book version of textbook needs to know the format of the e-materials. There is ePub system developed for users to act independent of the producers or publishing houses.

EPUB (short for Electronic Publication) is the distribution and interchange format standard for digital publications and documents based on Web Standards (IDPF, 2013). Epub provides accessibility to the e-books being independent of the producers or publishing houses. Epub is a format making the e-books more common.

5.2. Some Interaction Types to be used in Interactive E-Books

It was noted that the flexible design of eBooks distinguishes printed books. In generating e-books in digital media it is possible to add different interactions. Yet, various coding needs to be done so that these interactions work at different media. Usually, mouse click is the tool between the learner and the content in producing the instructional material. Since the interactive e-books are readable in mobile devices, users gain new interaction experience. This is called “touching”. Using finer all over the screen of the mobile devices does “Touching”. Especially, tablet computers are typical example of “touching”. Some interaction types are utilized for benefiting from interactive e-books in mobile devices. The users could develop such interactions not accessible via classical textbooks as experiences.

Audio / videos: Frequently used audio and video can be a part of interactive e-books. These items allow enriching the visual and auditory of the texts in the books. It is possible to form effective presentations of the audios and videos mentioned in a book.

Hot Spot: Hot spot is the type of interaction providing the design of interactive books that response to the user touching. For example, Hot Spot could be used for informing the user on a map located in an e-book by giving audio, text or video responses. By this type of interaction, the user could interact with the content by touching different areas of the screen.

Multiple Choice: Multiple choice is used as an evaluation tool in interactive e-books. Several options could be served asking a well define question to the user. Such quiz questions give the chance of testing the knowledge in the texts. Multiple choice is a kind of interaction that allows users to test their own development.

True / False: True/False is a kind of interaction used in the design with short answer questions or evaluation of activities such as user interaction. It can also be used as an assessment tool for learners. This interaction with users giving feedback is an attempt to create an effective reading experience.

Drag and Drop / Matching: Drag and Drop / Matching are a method used for traditional e-learning materials for learners in the production of reinforcement. It is possible to see the designs as instructional design on a topic in terms of assessment methods or as entertainment or gaming purposes. In a related interactive eBook in turn, exercises or tests can be used in the establishing such interactions.

360 Degree Views: is the interaction that allows view of learning objects internally or externally as a 360-degree. These type interaction elements are formed by experts using third party software. In the next phase of this, learning object is added to the appropriate sections in the eBook. Interactions that users cannot experience in real life are carried out.

Slide Shows: is in general, the type of interaction that allows sorting of images repeatedly. Users can watch slide transitions on a subject in the form of images. In this way too much space in the book of the images will be provided in a format compatible with display.

Illustration: are interactions of user input received from the interaction with the screen. These can reflect different results. An interactive math eBook with chart changes shown varying the values of the x and y coordinates is an example. This type of interactive structures could be presented in a web environment, although you may need special design for interactive books. It may take time to design this type of interactions. On the contrary, effective instruction could be established for better experiences of the learners.

6. Some Issues in Interactive e-Book Production

In this section, the issues in the production processes are evaluated from instructional design perspective. Experiences could be solutions to some of the issues.

6.1. Publication Platform and DRM

Not only the production of an e-learning materials is important, but also the posted up in the environment has quite importance. For the e-learning content to be published in the web environment that specifies the structure of the various standards and specifications SCORM (Shareable Content Object Reference Model) has been developed (ADL, 2014). In this way, content with certain standards can be displayed in any environment. It is difficult to mention a well define standard in interactive e-books.

Shortage of interactive books publishing platforms negatively affects the production process. Interactive e-books that have been produced on a computer with Mac OS platform can be displayed on tablets supporting Mac operating system only. Limited monitoring of the content has caused serious problems for producers. E-book files can be monitored on Mac OS, iOS, GNU/Linux, Android, Kindle, Windows operating systems or web browser extensions.

In order to protect the copyrights of the contents, DRM (Digital Rights Management) is developed. DRM software allows copyright owners to control, limit and restrict what users can do with their content (Ally & Tsinakos, 2014; Subramanya & Yi, 2006). DRM prevents copy and mass production of the contents of the e-books such as music, video, etc. Publishers and e-books producers attempt to market the contents on their own DRMs. This may cause serious problems. In order to publish the e-books, DRM fee needs to be paid. There are additional costs due to this. As the SCORM type standards become more common, platform independent content could be produced.

6.2. Development Area – Third party software or HTML5

One of the problems faced by e-book designers' is programming language.

In general, the instructional designer can produce an e-book; it is desired to use quick content production software (rapid eLearning).

E-book designers should be able to design the contents without prior knowledge of the programming languages. However, there different software used for producing e-books. When coding an interactive exercise with HTML5, placement of text on the screen has to use a different design program. At this point, eBook software designers can use easily does not exist.

6.3. Font– Typesetting

In transferring the texts to interactive e-books, there are issues in especially the case of Japanese, Chinese, Hebrew, and Arabic etc. fonts. These issues could be either cultural or software related. Especially designers with Latin alphabet and from left to write line writing experiences face these issues. Considering the line flow from right to left is an important issue to be taken into account. This requires experts in these foreign languages.

There needs to be special menus for these fonts and special characters. Changing the font does not solve the issue. Due to non-familiarity with the font flow and characters, these e-books are not preferred. In addition, the processes of these texts take longer. Not only font itself but also analyzing the characters separately causes timing problems in production. There is requirement for a general solution to this typesetting issue since most of the time these e-books with special fonts are the ones for teaching foreign languages.

6.4 Time Management

Production of eLearning materials, different teams, content formats, or computer software is a long process that requires the use of software. The process that began with the delivery of content in its raw form by creating interactive objects into interactive books ends with the addition into interactive e-book. In the process, an extension of the eBook's production time is caused by the disruption. Especially, the production time of illustration, 3D, and animation could be longer than expected. For this reason, there is timing issues in producing the e-books with denser interactions.

6.5 Bias

Innovation is perceived as new by an individual or a segment as an idea, practice, or an object. Any object considered as new is about the perception of that object as new.

Diffusion in this regard as the transformation process of that object to social systems via different channels (Rogers, 2003). Society's prejudice against technology, which is thought to be related to technology literacy, is a readiness issue.

Technological innovations in a large segment of society will facilitate widespread acceptance. In this respect, interactive eBook is an innovation. This elimination of prejudice against modernization of the interactive eBook design, manufacture or participate in evaluation processes are expected to provide a positive contribution.

Primarily as a practitioner of innovation unprejudiced evaluation of the teaching staff at universities can be said to have a positive contribution.

6.6 Team Work

Teamwork is necessary in producing e-books. The team members could be from different universities or institutes. The team will be more powerful if there is, for instance, instructional designer, software engineer, etc.

However, there could be a mistake of proud about the number of e-books. In particular, the academic textbooks require quality rather than quantity. Individual work lowers down the quality. Assigning several members for a team will help a lot.

6.7 Other Issues

In addition to academic problems, there are also area issues in e-book production. Portability, Alternative Content and Reasonable Prices are some of them (Kroszer, 2008). Steps to be taken to remedy this problem bias the disappearance of other issues highlighted in the title may offer opportunities for solving the issues.

7. Conclusion

Digital age forces us to gain new attitudes. Connecting to Internet, using smart phones, to be in the social are parts of our daily lives. As in the case of most areas, books are also digitized. User can interact with e-books either in mobile or web technologies. This interaction in the determination of appropriate teaching strategies and instructional designers is an important task. Identification of the problems encountered in the production process of interactive e-books will be guiding for possible solutions. Solution of different problems will provide the production of effective, efficient and attractive e-books.

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