Multimedia technology implementation to promote digital learning

Y Yulda* and I Widiaty

Universitas Pendidikan Indonesia. Jl. Dr. Setia Budi No.229, Bandung 40154, Jawa Barat, Indonesia

*yulda1@upi.edu

Abstract. The development of new technology has several impacts on people’s lives; one of which is the presence of multimedia technology. It is commonly known that one of the easily accessed multimedia technology are electronic books (e-books). This study identifies the implementation of multimedia technology implementation in forms of e-books to promote digital learning. The results showed despite the existence of several other options, e-books are still preferable due to its accessibility and usability. It has also been implied that e-books are relevant in both industrial and educational fields.

1. Introduction

The Oxford Dictionary of English defines e-books as “an electronic version of printed books”. E-book is defined as the paper book being converted to the digital format using scanner or typing to make it possible to be displayed on the computer [1]. In early 1992, van Dam proposed the phrase “Electronic Book” (also called e-book), which was widely referred to as the media using electronic channels to store and transport various information and multimedia [2]. Multimedia is the media that uses numerous forms of information contented and information processing (e.g. text, audio, graphics, animation, and video interactivity) to inform or entertain the user. Multimedia also mentions to the use of electronic media to store and knowledge multimedia content. Multimedia is alike to traditional varied media in fine art, but with a broader opportunity [3]. Now, modern e-books because have multimedia include animation, zooming in and out, musical scores, sound effects, text highlighting, built-in dictionaries, hotspots where the reader clicks to interact with a character or object, foreign language translations, and more [4]. Access to e-book multimedia technology is even easier with just a smartphone or tablet or laptop due to the sophistication of e-book software [5]. The advantages of using multimedia technology in online information education, real-life simulation, visual literacy, cost effective, and can store large amounts of data [6].

In developing multimedia e-books, in general e-books have many benefits, one of which facilitates users with the availability of multimedia [7]. Considering the benefits of various multimedia e-book technologies, this paper will discuss the most widely used multimedia and analyze the benefits in making e-books using the literature review method with 2 stages. First, search for and select relevant literature studies. Next, attach and gather related findings.
2. Methods
Method this paper is systematic literature review is used to identify relevant published from 2014 to 2019. Systematic review is a valuable source of evidence, where the author must summarize and analyze the scientific literature that can be relied upon by using a structured procedure based on the objectives that have been determined so that the different researchers can use them [8]. The article inclusion criteria used are Multimedia E-books, while the exclusion criteria are articles with abstracts, articles that do not use English and articles that appear not full text. Article search is limited only to articles in English that are accessed from internet database searches, namely: Google Scholar, Scientdirect, IEEE, Emerald, Springer, and Research Gate with the keywords ‘Multimedia E-Books, Development E-Books, and Technology E-Books’. Articles that meet the inclusion criteria are systematically collected and inspected. The search process found 20 articles that met the conditions of inclusion and exclusion.

3. Results and discussion
Based on the search results, there were 20 articles that were considered in accordance with the research objectives. Then evaluated which is more focused on multimedia feature innovations. Following the results of the analysis made in the form of media tables used, the benefits of the feature for E-Books.

Table 1. Multimedia features used in E-Books.

| No | Multimedia features | For E-Books |
|----|---------------------|-------------|
| 1  | Visual              | WIRED e-book in iPad as the research object. In research methods, through content analysis method through visual analysis tools available: the layout, fonts, colors, images, controls, and availability based on the availability of visual discussed. |
| 2  | Graphic/Design      | There are features such as 3D design for mapping, changing background colors based on text, multi-layer clustering and locality, and others. |
| 3  | System Book Roll with xAPI | System to access their course materials inside or outside of the classroom. The Book Roll system has several features including red and yellow markers to highlight important and difficult parts of a content, respectively. The system works within the Learning Analytics framework with the help of this framework, anonymized data regarding students’ reading behaviors in the forms of Experience API (or xAPI) statements are collected. |
| 4  | ESOTAG              | To define a model of an evolvable social resources taggable book (modeling of collaborative e-book). And that e-book featured social tagging makes readers more interested in reading e-books rather than plain e-books. |
| 5  | Augmented Reality   | Features for e-book readers to be able to feel the sensation of paper touch and book weight more real. And use new feature is Paranga. |
| 6  | Real-Time           | The system is designed to assists a group of authors to collaborate on writing, editing, reviewing, and revising document as a digital book across multiple devices in real-time interaction using internet network. The system integrates tools and collaborative writing framework in a web application as customizable workflow that guide writer team producing their work in effective and efficient means. |
| 7  | Animation           | Develop an animated e-book system (AES) that could accommodate gender differences. The fact that the AES provided multiple tools and rich media for males and females so they could interact with the AES in their own ways. |
| 8  | Digital Based Learning | Many studies have stated that Ebooks are successful as digital-based learning media with a significant level of influence on students / students. |
Table 1 illustrates the multimedia features used by e-books in order to improve their capabilities. It cannot be denied if e-books have many advantages, especially in the current era of globalization in the field of education. However, the latest innovations from e-books shows that this technology is still not optimal in providing services to its users. One of the enhanced capabilities in the interactive aspect begins with the multimedia part of Visual [7], then the Graphic / Design features [1,9-13] are also innovated. If you look at the level of research results it is known that the graphic / design section is experiencing more development and reader interest.

Furthermore, it is still in an interactive upgrade pattern, in the past 6 years many have developed ebooks by elaborating their multimedia features with the latest systems such as System BookRoll with xAPI [14-17], ESOTAG [18], Augmented Reality [19,20], Real-Time [21], and Animation [22]. This collaboration is used so that readers increasingly feel the ease of technology in reading / seeking knowledge.

Finally, researchers find that the ebook world cannot be separated from education, so ebook features for learning need to be thumbs up, such as Digital Based Learning [23-26]. Because digital based learning is very feasible to be developed through learning media called ebooks.

![Graph of Article 2014-2019](image)

**Figure 1.** Graph of articles on multimedia e-books technology.

From the figure 1 about graph of articles on multimedia e-books technology, it can be seen that the trends related to multimedia e-books technology were quite a lot in 2016, and fell slightly in the next 2 years, but again received the attention of researchers in 2019 now.

4. Conclusion

The technology in this research is in the form of multimedia features that have been developed over the past 6 years including visual, graphic / design, System BookRoll system with xAPI, ESOTAG, Augmented Reality, Real-Time, Animation, and Digital Based Learning. This Literature Review states about previous research conducted on the Multimedia E-Books approach. In this case, several databases were selected to retrieve articles published in the period 2014 to 2019. To meet the objectives of this study, all articles found were classified by author, year of publication, type of article or conference, context and type used both for application and for compared to its performance. The clearest findings in previous studies prove that with multimedia innovation e-books continue to develop, especially at an interactive level, because they want to have a positive impact on digital-based learning processes. However, it is still undeniable that the weaknesses of the E-Book still exist, and this has led to the emergence of other multimedia e-book technology innovations.
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