

A NEED ANALYSIS OF THE DEVELOPMENT OF A STORYBOARD GUIDEBOOK FOR MAKING INTERACTIVE MULTIMEDIA

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Abstract

This research affords a need analysis of the use of interactive multimedia in mathematic learning. A need analysis of the development of a storyboard guidebook for making interactive multimedia learning mathematics is also conferred. This research constitutes an initial development research phase, covering need analyses of the use of interactive multimedia and the development of a storyboard guidebook through questionnaires distributed to students. Samples were students of semesters 3 and 7 at the Mathematics Department Universitas Muhammadiyah Sorong. Results brought about mean percentage scores of 84% for the student need for interactive multimedia and 100% for the student need for a storyboard guidebook for making interactive multimedia for learning mathematics at Universitas Muhammadiyah Sorong. To conclude, students needed interactive multimedia for learning mathematics and a storyboard guidebook for making interactive multimedia in the mathematic learning media development course at Universitas Muhammadiyah Sorong.

Keywords: Use about five keywords or phrases in alphabetical order, Separated by Semicolon

1. INTRODUCTION

Advanced information and communication technologies in the education world are crucial. They will facilitate the teaching-learning process, allowing the expected learning objectives to be achieved [1]. Teachers accordingly have to have higher creativity in a learning activity. They must be creative, especially in putting information and communication technologies to work as learning media [2]. The use of learning media is perceived as essential in learning. Learning media function as supporting instruments for an effective and efficient learning process [3]. Related to learning media, teachers can choose the approach of using interactive multimedia to enable students to understand materials and actively engage in learning activities [4].

Interactive multimedia are imperative for enhancing student learning [5]. Students can use a range of types of media, e.g., pictures, videos, audio media, and animation, using interactive multimedia. It will escalate student interest and help learning become attractive and fun for students [6]. Additionally, interactive multimedia make students understand a complex concept more easily using pictures and animation [7]. They also facilitate project-based learning. As such, students can use them to concoct a presentation, video, or other multimedia projects to deepen their understanding of a topic [8]. They can also be directly engaged in interactive multimedia learning and self-decide which materials are going to be studied. It will heighten their participation [9]. More importantly, interactive multimedia allow teachers to observe

better and give feedback. It will enable students to improve their understanding of a topic [10]. Interactive multimedia hence do good for students to understand learning materials.

Making interactive multimedia requires a good and structured plan. An efficient way to make such a plan is using a storyboard. A storyboard is a visual design which describes steps for making an interactive multimedia product. And yet, some students are identified as having inadequate knowledge of making a good and effective storyboard [11]. A storyboard guidebook for making interactive multimedia is therefore important for making students understand and apply storyboard concepts.

Students need to understand how to implement storyboard concepts in the making of interactive multimedia. Several relevant references can be used to allow students to learn some storyboard-related ideas [12]. However, evidence demonstrates no implementation of storyboard use concepts for making interactive multimedia. The cause is because of no knowledge concerning the use of storyboards. It causes adversity to students when making interactive multimedia. Furthermore, making interactive multimedia without a storyboard will likely warrant a longer time and engender a non-quality appearance.

Student needs for a storyboard guidebook are obvious, as a storyboard makes students make interactive multimedia more efficiently [13]. Making interactive multimedia devoid of a good storyboard will call for a longer time and engender poor interactive multimedia. A good understanding of storyboards will ensure good-quality interactive multimedia made [14]. In so doing, we carry out this research to analyze student needs for a storyboard guidebook for making interactive multimedia.

Research concerning the use of storyboards to make interactive multimedia has been available. Among them is research introducing batik isen-isen using interactive multimedia. The research engenders an application which can function well [15]. Another research generates a good application for learning the Cantonese language. The application is consistent with the literature in the Cantonese language book studied [16]. This research offers distinctiveness. We make this research focus on student needs for a storyboard guidebook for making interactive multimedia to learn mathematics.

Effective interactive multimedia should be advocated by good facilities and infrastructures, such as a good guidebook which corresponds to student needs. A need analysis is hence demanded to increase the quality of interactive multimedia-based education and student interest in this area. It is also indispensable to guarantee that students can understand and well apply storyboard concepts to make interactive multimedia. It is also instrumental in enabling students to make interactive multimedia and manifest quality mathematic learning. In terms of novelty, this research presents new information regarding student needs for a storyboard guidebook for making interactive multimedia to learn mathematics.

2. LITERATURE REVIEW

2.1 Storyboard

A storyboard helps create a visual representation of a story from either a movie, animation, or interactive media. It allows efficient idea communication and is useful in planning a structure and pacing of a narration. We explore the history of storyboards, their use, limitation, and application in many different fields through this literature review [11].

A storyboard is necessary for making interactive multimedia [17]. It is utilitarian when we desire to visualize user interface designs, content structures, and user interaction. A storyboard may contain the following:

- 2.1.1 User interface design: a storyboard can be used to design a user interface layout and demonstrates how users interact with multimedia. It can cover a page sketch, button, icon, and other design elements.
- 2.1.2 Content structure: a storyboard allows us to plan and visualize a content structure. For example, it informs users how to make and organize content in interactive media. It encompasses scene orders, navigating menus, and storylines users have to follow.
- 2.1.3 User interaction: a storyboard can tell how users interact with multimedia. It includes specific actions expected from users, such as pressing a button, dragging an element, and playing with sounds/voices.

A storyboard enables the creative team to plan and visualize the design and interaction before commencing the actual development of interactive multimedia. It helps users warrant that the generated content is in concert with the predefined vision and aims. Additionally, it can minimize both production time and costs [18].

2.2 Multimedia

Multimedia refer to a combination of some media, e.g., texts, pictures, sounds/voices, animation, and videos, in a single digital presentation. They are typically used within an interactive context. Multimedia users can thus interact with multimedia elements and make an action or decision using the information delivered [19]. Several common uses of multimedia are in business presentations, long-distance learning, digital entertainment, and online communication [20]. Multimedia are capable of delivering information in a more attractive and understandable fashion. Multimedia users are usually diverse yet make a single unit.

Multimedia are also useful for creating more deep-seated and attractive visual and audio experiences. For instance, they make a significant contribution to movie or game making. Using multimedia will allow users to create a real-life-like fictional world and to be more engaged in the narration or game [21].

The use of multimedia is ever-growing and increasing, particularly in this digital era. Multimedia is more accessible due to the availability of the Internet and other digital technologies [22].

Nevertheless, we have to grow our concerns when using multimedia due to their significant effect on the community. Inappropriate or immoral content may have a negative impact on students, specifically children. Strict monitoring and regulations concerning the use of multimedia among children must be imposed to maintain the quality and influence of multimedia on the community [23].

2.3 Interactive Multimedia

Interactive multimedia combine some elements, such as texts, pictures, sounds/voices, animation, and videos, to interactively communicate information and messages with users. Interactive multimedia users can participate in learning experiences or entertainment by doing a certain action, such as pressing a button, selecting an option, or playing a game [24].

Interactive multimedia are applicable in a range of contexts, e.g., learning, promotion, entertainment, and business. In learning, they can be very helpful in giving off attractive and effective learning experiences using interactive elements and features. In addition, in promotion, they can be used to make an interesting and interactive presentation to introduce a product or service [25].

3. METHODOLOGY

This research constituted an initial development phase. It was limited to a need assessment to examine student needs. Two aspects were investigated here, i.e., student needs for interactive multimedia to learn and student needs for a storyboard guidebook for making interactive multimedia. The research population covered all students at the Mathematic Department Universitas Muhammadiyah Sorong. Research samples were students of semesters 3 and 7 at the Mathematic Department Universitas Muhammadiyah Sorong. The students were selected as samples, considering they were given a final task of making interactive multimedia for completing the mathematics logic course for third-semester students and the non-Euclid geometric course for seventh-semester students. Data collection was using questionnaires. Research data were qualitative, thereby demanding a descriptive-qualitative method to process the data, which entailed a narrative interpretation of both their content and processes [26]. The following seven questions were proposed in the questionnaires of the student needs for interactive multimedia to learn.

- 3.1. Is the use of computers a life necessity in this global era?
- 3.2. Does the use of interactive multimedia in learning induce fun learning (not a boring one)?
- 3.3. Do you prefer the use of multimedia in learning?
- 3.4. Do you agree with mathematic learning using interactive multimedia?
- 3.5. Are interactive multimedia difficult to develop?
- 3.6. Have you acquired materials related to the development of interactive multimedia for learning?
- 3.7. Have you made interactive multimedia for learning?

The following three questions proposed in the student need questionnaires regarding the development of a storyboard guidebook.

- 3.1. Considering the explanation above, is the use of a storyboard guidebook for making interactive multimedia for learning interesting?
- 3.2. Is a storyboard guidebook necessitated in the making of interactive multimedia for learning?
- 3.3. Do you agree with making a storyboard prior to the making of multimedia interactive to allow a more efficient making?

4. RESULTS AND DISCUSSION

The questionnaires distributed to observe student needs for interactive multimedia for learning and a storyboard guidebook for making interactive multimedia brought to light the following findings.

4.1 Need for Interactive Multimedia for Learning

Table 1 exhibits the results of the questionnaires probing student needs for the use of interactive multimedia in learning responded by 23 respondents.

Table 1 Student Needs for the Use of Interactive Multimedia in Learning

Responded Indicator	Frequency (F) and Percentage (%) of Each Score			
	No (0)		Yes (1)	
	F	%	F	%
Question 1		0	23	100
Question 2	1	4	22	96
Question 3		0	23	100
Question 4		0	23	100
Question 5	7	30	16	70
Question 6	7	30	16	70
Question 7	11	48	12	52
Mean	0.16	16	0.84	84

As indicated in Table 1, the question “Is the use of computers a life necessity in this global era?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It pointed out that all respondents agreed with computers as life necessities. The question “Does the use of interactive multimedia in learning induce fun learning (not a boring one)?” was responded to “Yes” by 22 respondents hence at a percentage of 96%. It showed that the use of interactive multimedia in learning was fun. The question “Do you prefer the use of multimedia in learning?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It stated that all respondents preferred learning using interactive multimedia. The question “Are interactive multimedia difficult to develop?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It suggested that all respondents agreed that multimedia interactive

was not difficult to develop. The question “Are interactive multimedia difficult to develop?” was responded to “Yes” by 16 respondents hence at a percentage of 70%. Respondents with a “Yes” response generally mastered technology and were facilitated with sufficient facilities and infrastructures. Seven respondents with a “No” response, hence at a percentage of 30%, generally did not master technology and were not equipped with sufficient facilities and infrastructures. The question “Have you acquired materials related to the development of interactive multimedia for learning?” was responded to “Yes” by 16 respondents hence at a percentage of 70% and “No” by seven others hence at a percentage of 30%. It demonstrated that the majority of respondents acquired materials related to the making of interactive multimedia. The question “Have you made interactive multimedia for learning?” was responded to “Yes” by 12 respondents hence at a percentage of 52% and “No” by 11 respondents hence at a percentage of 48%. It exhibited that over much of the respondents had experiences of making interactive multimedia. Table 1 also indicates that the mean score of student needs for the use of interactive multimedia for learning at Universitas Muhammadiyah Sorong was 84%.

4.2 Student Need for a Storyboard Guidebook for Making Interactive Multimedia for Learning

The other need analysis was targeted to scrutinize the degree to which students needed a storyboard guidebook to make interactive multimedia in the learning media development course. The definition of a storyboard was given to respondents before they were instructed to answer the questionnaires, giving them an initial understanding. The results pointed out the following responses: The question “Considering the explanation above, is the use of a storyboard guidebook for making interactive multimedia for learning interesting?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It implied that respondents found a storyboard to be a new learning medium. The question “Is a storyboard guidebook necessitated in the making of interactive multimedia for learning?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It pointed out that respondents called for a storyboard guidebook for making interactive multimedia. The question “Do you agree with making a storyboard prior to the making of multimedia interactive to allow a more efficient making?” was responded to “Yes” by 23 respondents hence at a percentage of 100%. It showed that respondents agreed with using a storyboard guidebook for efficiently making interactive multimedia.

5. CONCLUSION

Results stated that students demanded interactive multimedia for learning mathematics. Besides, all students required a storyboard guidebook for making interactive multimedia in the mathematic learning media development course at Universitas Muhammadiyah Sorong. The results of student need data analyses, therefore, recommended to develop a storyboard guidebook to allow students to make interactive multimedia easily. This research also suggests that lecturers and students use this storyboard guidebook to either give assignments or finish the assignment of making interactive multimedia.

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