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IbisPaint X Apps in Creating Collaborative 3D Learning media of Pop-Up and Movable Books

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Abstract. The IbisPaint X Apps was an application with a concept of “share the fun of drawing” that had a function to draw many detailed designs. This study aimed to investigate how was the role of IbisPaint X Apps in supporting the process of creating collaborative 3D learning media of pop-up and movable book. This study was a library research. The procedures of study were used the theory of Mary W. George that implemented nine stages. The sources of data were taken from national and international journals, Indonesian and foreign textbooks. The results of study showed that IbisPaint X Apps could be used in creating collaborative 3D learning media of pop-up and movable books because it had complete features and could create good and detailed pictures. This collaboration created a 3D learning media that was more interesting, unique, and had two working mechanisms.

1. Introduction

The IbisPaint X is an application with a concept of “share the fun of drawing” that had a function to draw many detailed designs. This application has the same functions as Adobe Photoshop. The purposes of this application are to communicate, draw, and develop the drawing skill for beginners in digital drawing. The IbisPaint X is able to be free downloaded on Android smartphone via playstore or IOS. It has 2500 materials, more than 1000 fonts, 325 brushes for drawing, 63 filters, 46 screentones, 27 mixed models, image recording process, stroke (shadow) stabilization feature, various ruler features such as radial line rulers and clipping mask. This application can be downloaded through browser at the link <https://ibispaint-x.id.uptodown.com/android/download> or via Android smartphone through playstore apps. The symbol of IbisPaint X can be seen in figure 1.



Figure 1 The symbol of IbisPaint X apps



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The advantages of IbisPaint X Apps include, (1) being able to make good images up to the smallest details, (2) having various types of canvas, (3) having 142 types of pencils and other supporting tools, (4) being able to import pictures from the gallery to be merged on the layer, (5) being able to share the design process with the community, (6) being able to find the designs of another user and learn it. [1] Fauziah explains that the advantages of IbisPaint X apps are, (1) many types of fonts to be used, (2) the canvas can be customized, (3) user friendly, (4) many tools, (5) easy to insert pictures, (6) can be directly saved using transparent background (PNG), (7) better results, (8) able to be downloaded in Android and IOS, (9) having a video feature.

This application has many benefits in the education field. [2] These benefits can be viewed from the result of a research by Burhanudin, Nurhidayah, Chaerunisa that shows the missionary media through Instagram in forms of photos or videos can be created by using IbisPaint X Apps. [3] The result of a study by Lestari shows that momentum comics and folklore-based impulse about Panglima Syawal that are compiled using the IbisPaint X are suitable to be used as learning support media. Another learning support media that utilise IbisPaint X apps are 3D media. The media is a tool to link up the learning informations and messages. According to Hasanudin [4], media is anything that is able to be used to deliver messages from the sender to the recipient in order to stimulate students' thoughts, feelings, concerns, and interests when the learning process occurs.

The 3D media is media that is able to be viewed from various ways in the original or imitation form. [5] It belongs to a media without projections that is presented in a visual dimensional manner. It is able to be touched so it helps in realizing the real objects. It can be in form of (1) unmodified real things, (2) modified real things, and (3) specimens. [7] The 3D media in form of sophisticated software that is capable of creating 3D animations, such as creating its objects, adjusting the camera motions, providing effects, sending videos and sounds. The other capabilities are able to create figure, landscape, and title animations. [8] One of technologies that can be implemented is the use of 3D method named augmented reality. The forms of 3D media that are able to be utilized as learning media are pop-up and movable books. Pop-up is two or three dimensional picture that has been existed since 800 years ago. Its lovers are not only kids but also adults. [9] Pop-up is not just an usual 3D media, it utilizes capable movements that arouse readers' intention and happiness. [10] It starts to be more interesting because it is supported by 3D visualization [11] that is able to attract students in learning.

The principles of developing 3D pop-up books are based on questionnaires to the teachers [12] that include, (1) being able to provide creative and imaginative learning atmosphere for students, (2) the cover have to contain a picture about nature, (3) A4 paper size, (4) illustrated images about nature. The result of a submission program by Hasanudin, et al [13] shows that in creating pop-up media, the teachers follow the steps that have been instructed, the finished pop-up then collaborated with the printed characters. This collaboration leads them to be able to create 3D learning media. Sabuda in [14] states that the strengths of pop-up media are (1) the visualization of the story presented is more interesting, (2) the image display has dimensions, (3) there are movable images when it is opened, (4) provide surprises on each page, (5) reader friendly. The weaknesses of pop-up media are (1) it takes longer time in processing, (2) it requires accuracy, (3) the higher quality material, (4) the price is expensive.

Based on the weaknesses, the process of creating pop-up media can be collaborated with the movable books. [15] Movable book is interpreted as a book that involve a mechanical role on the pages arranged, so the pictures or some parts of the page appear to move, have a shape or dimension. [16] It is able to be classified as animated books that utilize papers for animated pictures by drawing certain parts so the page can be lifted up and form a 3D pattern. [17] Movable book has pages with mechanical movements when it is opened and closed. [18] [19] The ways in using movable and conventional books are different. In movable book, the readers need to manipulate objects to understand all elements (words and pictures) of it. Every movement caused by movable book creates a change of meanings. In modern media, the term 'reader' means a person who makes interaction in an interactive story.

The learning process that implements movable books [20] has some advantages namely, (1) facilitating in explaining objects, (2) facilitating in teaching elementary students, (3) visualizing the world around us, (4) creating a more enjoyable, effective, interactive, and meaningful learning

experiences. [21] Because of the mutual benefit between the director (creator) and the movable book, Faden uses it as a theory of how the reader and viewer negotiate in each case about the linear narrations, interactive visuals, and spectacular effects.

This study is worth doing to provide a comprehensive view toward the role of IbisPaint X apps in creating collaborative learning media. The collaboration between pop-up media and movable book supported by the IbisPaint X apps will produce an attractive, easy to make, and inexpensive 3D learning media

2. Methods

This study was a library research. Sugiono in [22] said that a library research is a theoretical, referential, and literature study about cultures and moral values. [23] Literary-based research was a study that uses literatures as the objects of study. [24] The basics of library research included library organizations, types of materials available, information access, and research strategies. [25] A library research limited its activities to the study of literature references not to the research field.

The research approach in this study was very suitable to be used in designing 3D media by using an application to provide a clear overview for the teachers, lecturers, and students in producing learning media and implementing it in the class. This study described the IbisPaint X apps, pop-up media, movable book, and how this application and both media created a 3D learning media. The data in this study were secondary data that were relevant to the topic of discussion. The data sources were Indonesian and foreign textbooks, research articles published in national and international journals. This study not only presented facts derived from secondary data, but the researchers also analyzed the data based on the research procedures so it produced a concept of creating 3D media.

The research procedures in this study implemented the theory of Ma² W. George. [26] George explained that there were nine stages in library research process namely, (1) choosing a general topic, (2) engaging your imagination, (3) highlighting one or more research questions as a result of brainstorming about your topic, (4) developing a research plan or strategy, (5) consulting reference tools and searching databases, (6) identifying and obtaining sources, (7) evaluating sources in the light of your research questions, (8) experiencing an insight based on reflection, and (9) crafting a thesis statement based on your insight. It could be seen in figure 2.

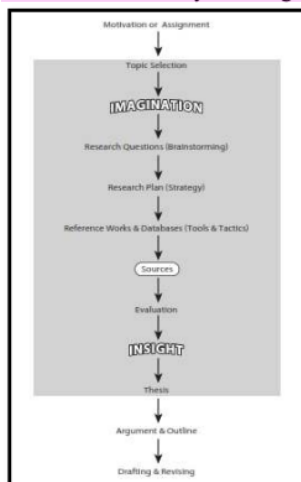


Figure 2. Diagram of the Library Research Process

3. Results

The process in creating collaborative 3D media between pop-up and movable book by using IbisPaint X apps followed the following techniques,

3.1 Technique of getting ideas

The ideas had to be in line with the basic competence of the curriculum in the school, in line with the knowledge, and contained a novelty. When the idea did not contain a novelty, the concept of media would not support the students' creative thinking ability. [27] The students who had creative thinking ability were able to generate new ideas. After getting an idea, it was compiled in form of fiction, guesses, animal and plant series, some theories on global environmental issues, and the materials on how to preserve natural resources. These concepts could foster the students' naturalistic intelligence. Rose in [28] said that someone with a high naturalistic intelligence was he who loved to keep animals, able to recognize and mention many types of plants, interested in the global issues and believed that the preservation of natural resources and sustainable growth was a must.

3.2 Technique in Creating Design

The design of 3D learning media could be made by using IbisPaint X apps. The design was in form of characters, fruits, letters, numbers, or even the templates for 3D learning media. In designing 3D media had to pay attention to, (1) the target audience (users of 3D learning media), (2) some elements of design such as line, shape, texture, space, size, and color, (3) the design principles such as balance, rhythm, emphasis, unity, (4) the color theory, including primary, secondary, tertiary, and neutral colors, (5) typographic theory, (6) layout, (7) paper types, (8) print out.

3.3 The Concept Technique of Collaborative 3D Learning Media of Movable Book and Pop-up

Movable book was 2D media that able to be moved in the media mechanism. Pop-up was 3D media that able to appear in the surface of pages in the media mechanism. Both mechanisms were able to be combined to create a 3D learning media that was more interesting, unique, and had two mechanisms at the moment.

3.4. Technique of Compiling Collaborative 3D Learning Media of Movable Book and Pop-up by Using IbisPaint X Apps

The technique of compiling collaborative 3D learning media of movable book and pop-up by using IbisPaint X apps was started with the following steps,

- 1) *Creating an image design on the IbisPaint X apps as shown in figure 3,*



Figure 3. The image design on the IbisPaint X apps

- 2) *Preparing the file to be printed,*

The image files that would be printed as pop-up objects had to be saved in the smartphone gallery before (in line with step 1). The results of it from the IbisPaint X apps could be seen in figure 4.

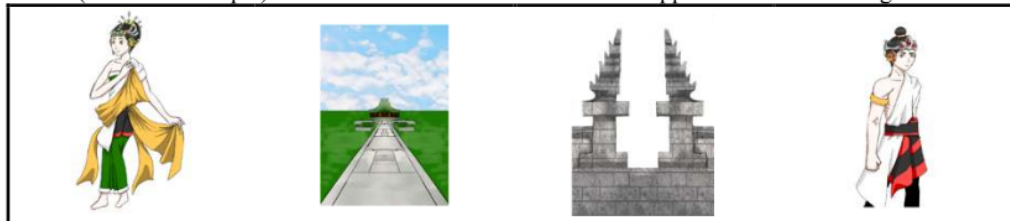


Figure 4. The file from IbisPaint X apps

3) *Printing out the file on the art paper in appropriate size,*

The images/objects then were arranged in Ms Word or Adobe Photoshop. This arrangement aimed to facilitate the printing of 3D media materials. The file that would be printed could be seen in figure 5.

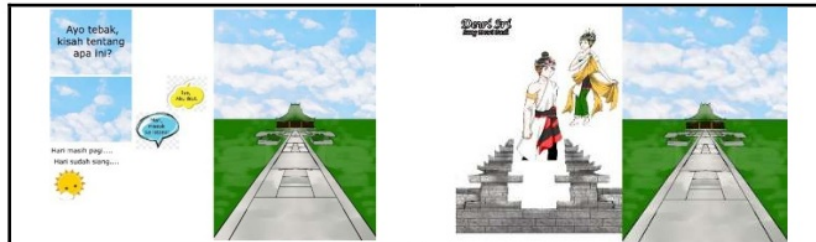


Figure 5. The results of print out on the art paper

4) *Cutting out the objects by using cutter,*

5) *Creating a concept of movable book as shown in figure 6,*



Figure 6. The concept of movable book



Figure 7. The changes in the concept of movable book

In figure 6, the position of the sun was at the bottom of the picture, this indicated that the day was still morning (according to the actual context in the real world). There was a statement “In the morning[hari masih pagi]”. It was a sign to invite the readers to imagine if the day was still morning because the sun was in the below. In figure 7, the sun rose up in the air. It indicated the day was noon. There was a statement “At noon[hari sudah siang]”. It was a sign to invite the readers to imagine if the day was noon because the sun was almost above the house (see fig. 7). The changing positions of the sun were the concept of movable book. It meant something was able to be moved. In fig. 6 and fig. 7, the sun acted as the object that able to be moved. This displacement provided the sensations for readers. When the book was used to tell a story, the storyteller would tell the activities carried out in the morning until the day (at noon) by moving the sun. This concept could foster the students’ imagination.

6) *Making the concept of lift the flap as shown in figure 8,*



Figure 8. The concept of lift the flap

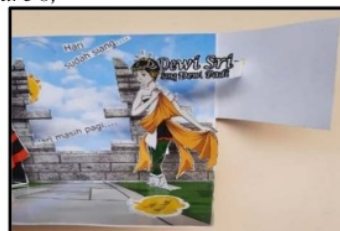


Figure 9. The changes in the concept of lift the flap

The figure 8 showed a hidden object. It could be seen by opening (lifting) the paper with a statement "Can you guess it? [*Ayo tebak kisah tentang apa ini*]". When the reader opened it, the hidden object would be appeared as shown in figure 9. This concept was called lift the flap. It invited the readers to open the flap and find the hidden object. In figure 9, there was a woman object (the story entitled '*Dewi Sri Sang Dewi Padi*'). The concept of lift the flap was suitable to be implemented in guessing game. Before the flap opened, the readers were invited to find the answers based on their intuitions or thoughts. This concept was believed to be able to improve students' logical thinking.

7) Arranging pop-up

Arranging pop-up was the most complicated part because the objects must be arranged to make it appear as 3D media and not damaged when opened or closed. In this stage, it required (1) creative thoughts, Santrock in [29] said that an important aspect of thought was creative thinking ability. According to Munandar in [30], it meant able to find many possible answers to a problem, (2) the exact size or positions of each object, (3) the attachment also became the main factor in the success of arranging pop-up.

8) Arranging collaborative 3D media between pop-up and movable book

This step was the final step in arranging 3D learning media. The final result was shown in figure



Figure10. Collaborative 3D media between pop-up and movable book

Figure 10 was an example of collaborative 3D media between pop-up and movable book that had been completed. To make 3D book/media, we had to repeat the above steps many times as needed. The requirements of 3D learning media [6] to be effective were, (1) it had to be large and clear enough, (2) using safe objects, (3) able to be integrated with another media, (4) stored and did not need to be displayed. [31] The learning media was able to present a local wisdom practices that could be used as a strategy to build national integration within the framework of *Bhinneka Tunggal Ika*.

4. Conclusion

The results of study showed that IbisPaint X Apps could be used in creating collaborative 3D learning media of pop-up and movable books because it had complete features and could create good and detailed pictures. This collaboration created a 3D learning media that was more interesting, unique, and had two working mechanisms

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