Interactive Animation Media of Sea Biota Design for Young Learners

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Abstract. Abstract. Interactive animation media could provide children good experience and imagination, which serve as important aspects in their intelligence development. However such media that incorporate children’s multiple intelligences and specifically focus on marine biota are relatively limited in number. To have such media is particularly relevant for Indonesia to build awareness among children towards marine environment preservation. Within that framework, the current study attempts to develop interactive animation media on marine lives through waterfall System Development Life Cycle (SDLC). Although the study is still in its analyzing and designing stages, to this point it has shown that the architectural design of the media might benefits classroom activities related to sea biota.

1. Introduction

Currently, there is an increase of animation-based interactive learning media use among young learners. Such media seem to provide good experience among children and—as a result—tend to increase their imagination. These have been believed to positively affect children’s intelligence development. Children’s intelligence needs to be nurtured since early age as it is believed that their first five years are the optimal period for their brain development. Furthermore, learning through interactive animations is considered to be better compared to conventional learning methods because it is deemed more communicative in delivering learning materials, which allows children to retain what they have learned longer[1]. Animation is also considered to be superior compared to static images in demonstrating conceptual changes, procedures, and dynamic processes[2] since interactive media facilitates two-way interactions between its user and the media.

The current study attempts to produce an interactive learning media with sea biotas as its theme. It is due to the fact that Indonesia is one of the biggest archipelago countries, Indonesia is also one of the countries with the longest shorelines in the world and vast sea territories covering inland waters and territorial seas, providing habitats for abundant sea biodiversity. Furthermore, its sea biotas are highly varied and unique compared to those of other countries. These facts lead to acknowledgement that Indonesia is a country with “mega diversities in the world”. Preserving Indonesia’s sea biodiversity starts from introducing sea biotas to children, which is expected to lead to being interested in, caring for, and preserving the biodiversity.
Similar attempts have been done by several researchers as seen in Table 1 below.

| Utilization                                                                 | References |
|----------------------------------------------------------------------------|------------|
| Interactive animation media for learning digital fashion designing         | [3]        |
| Interactive animation media for introducing air, land, and sea animals      | [1]        |
| Animation media on plants anatomy                                          | [4]        |
| Interactive animation media for teaching descriptive geometry.             | [5]        |

In addition to learning activities, interactive animation media could also enhance children’s multiple intelligences. Azizah, for example, has attempted to do digital storytelling which she argues to be beneficial for preschool learners[6]. Accordingly, the current study attempts to produce interactive animation learning media for improving 5-6-year-old children’s intelligence.

2. Methodology

In line with the elaboration above, the interactive animation media design is expected to aid children in nurturing their multiple intelligences. The study involved three steps, as illustrated in Figure 1. The first step is reviewing literatures related to multiple intelligences and interactive media. The second step is conducting online interviews with teachers of Labschool Kindergarten of UPI Serang. The third step is designing interactive animation media using flowchart and storyboard.

3. Result and Discussion

3.1. Multiple Intelligence

Interactive animation media of sea biotas is designed to nurture children’s multiple intelligences. The multiple intelligences in this study are those of linguistic, logical-mathematical, visual-spatial, bodily, musical, interpersonal, intrapersonal and naturalist. Those intelligences are divided into respective activities in the interactive media. Teachers also play important roles in nurturing their students’ multiple...
intelligences. Thus, the teachers’ roles when using the media are described in Table 12. The use of the media is expected to improve preschool children’s cognitive aspects as well[7]

3.2. Interview
The preliminary data was gathered through online interviews with teachers of Labschool Kindergarten of UPI Serang. The interviews focused on collecting data of how interactive animation media focusing on sea biotas for children should be designed. Generally, the answers emphasize attractive design and real-life imitation of the sea biotas. Accordingly, the sea biotas in the media include sharks, whales, crabs, starfish, octopuses, jellyfish, squids, clownfish, blue tang fish, Moorish idol fish, and dolphins, with corals as background.

3.3. Flowchart
Flowchart is a diagram that portrays a procedural process. Designing interactive media using flowchart makes it easier to understand how the media works. Figures 2-4 below illustrates the media’s “main” and “sea biota” menus’ flowcharts.

![Flowchart of main menu.](image)

In the main menu, there are three selective menus: “sea biota”, “about” and “created by”. If one selects “sea biota” menu, sea biota interface will be shown (further illustrated in Figures 3 and 4). When one selects “about” menu, descriptions of interactive animation media of sea biotas will appear. Should one select “created by” menu, interface showing the designers of the media will be shown.

“Sea biota” menu can be further illustrated into two flowcharts, as seen in Figures 3 and 4. The menu comprises of activities representing the eight multiple intelligences (Linguistic, math logic, visual bodily, untuk Musical, Interpersonal, Intrapersonal dan Naturalist). For instance, when the “linguistic” button is selected, a user interface entitled ”Let’s Get to Know Me Better” will appear. The interface shows sharks, whales, octopuses, and starfish pictures. When a picture is selected, a voice recording that briefly describes the animal will be played.
3.4 Storyboard
The next step in designing the media was making storyboards, which are commonly done in pre-production or pre-visualization phase. It shows frame-by-frame images of the media[8]. Storyboards enable a media designer to visualize his/her ideas[9]. The use of storyboard as an initial step to produce an interactive media has been done by several other researchers (see Table 2).

| Uses                                | References |
|-------------------------------------|------------|
| Multimedia Adventure Games          | [10]       |
| Multimedia storyboading dengan menggunakan content based | [11]       |
| Multimedia retrieval                |            |
Android-based lab simulation application [12]
Scientific Literacy Comics [13]

Table 3. Main Menu storyboard.

| Asset(s) | Visual | Audio |
|----------|--------|-------|
| A whale  | Showing a whale and circles containing “SEA BIOTA”, “ABOUT” and “CREATED BY”. | Backsound |
### Table 4. “Let’s Get to Know Me Better” storyboard.

| Frame title: Let’s Get to Know Me Better | Intelligence: Linguistic |
|-----------------------------------------|--------------------------|
| **Asset(s)**                            | **Visual**               | **Audio**            |
| A shark, a whale, a crab, a starfish, and an octopus | Showing all assets and each asset’s description whenever the asset is clicked | Backsound: |

### Table 5. “Let’s Count Me” storyboard

| Frame title: Let’s Count Me | Intelligence: Logical Mathematical |
|-----------------------------|------------------------------------|
| **Asset(s)**                | **Visual**                         | **Audio**            |
| Sharks, whales, fish        | Showing one of the assets, for instance sharks, and showing an instruction to count the number of the sharks on the screen (user can choose a number from 1 to 5 in the circles). | Backsound |
### Table 6. “Let’s Find My Shadow” Storyboard

| Frame title: Let’s Find My Shadow | Intelligence: Visual Spatial |
|-----------------------------------|-----------------------------|
| [Image of a underwater scene with octopuses, fish, and squid] | |
| Asset(s)                          | Visual                      | Audio                |
| Octopuses, fish, squids           | Showing all assets and their shadows and instructions to match the assets and their shadows | Backsound |

### Table 7. “Let’s Dance” storyboard

| Frame title: Let’s Dance | Intelligence: Bodhly/Kinesthetic |
|-------------------------|----------------------------------|
| [Image of a cartoon showing “Baby Shark” video] | |
| Asset(s)                | Visual                          | Audio                |
| “Baby Shark” video      | Showing “Baby Shark” moves       | “Baby Shark” song    |
| Frame title: “Let’s Guess My Voice” storyboard |
|----------------------------------------------|
| **Intelligence:** Musical                    |
| **Asset(s)**                                  |
| Whale, dolphin                                |
| Visual:                                      |
| Showing all assets and ‘sound’ symbols; playing relevant animal sound and showing instruction to guess the animal if user click ‘sound’ button |
| Audio:                                       |
| Sounds of whale and dolphin                  |

| Frame title: “Let’s Play with Friend” storyboard |
|-----------------------------------------------|
| **Intelligence:** Interpersonal Intelligence   |
| **Asset**                                     |
| Jellyfish, squids                             |
| Visual:                                       |
| Showing jumbled letters of the name of an asset and showing instructions to arrange the letters into the asset’s name |
| Audio:                                        |
| Backsound                                     |
Table 10. “Let’s Find the Fish You Like the Most” storyboard

| Frame title: Let’s Find The Fish you Like The Most |
| Intelligence : Intrapersonal |

| Asset(s)                        | Visual                                                      | Audio               |
|---------------------------------|-------------------------------------------------------------|---------------------|
| Clownfish, blue tang fish, Moorish idol fish | Showing all assets and a question about user’s favorite fish | Backsound           |

Table 11. “Let’s Feed Me” storyboard

| Frame title: Let’s Feed Me |
| Intelligence : Naturalis |

| Asset(s) | Visual | Audio   |
|----------|--------|---------|
| dolphin  | Showing a dolphin, a fish, and a plastic trash. If the dolphin is fed with fish, it shows happy expression. When it is fed with plastic trash, it shows sad expression. | Backsound |
Teacher plays an important role in using the media optimally. Table 12 below elaborates some scenarios a teacher can perform when using the media

| Frame                     | Peran Guru                                                                 |
|---------------------------|-----------------------------------------------------------------------------|
| Let’s Get to Know Me Better | 1. Teacher introduces the names of the animals (different colors and shapes);  
2. Teacher tells the animals habitats  |
| Let’s Count Me            | 1. Teacher asks students to count together the number of sharks and whales  
2. Teacher compares the numbers of sharks and whales. |
| Let’s Find My Shadow      | Teacher asks students to match objects with their shadows.                  |
| Let’s Dance               | Teacher sings and dances together with students.                            |
| Let’s Guess My Voice      | 1. Teacher asks students to concentrate on listening to the sea animals’ sounds;  
2. Students are asked to guess the animals from the sounds. |
| Let’s Play With Friend    | 1. Teacher asks students to arrange the jumbled letters with their peers  
2. Teacher assists students to arrange the letters. |
| Let’s Find The Fish you Like The Most | 1. Teacher asks students to say their favorite animals;  
2. Students explain their reasons of favoring certain animals. |
| Let’s feed me             | 1. Teacher explains that animals need healthy feedings;  
2. Students feed healthy feedings to dolphin;  
3. Teacher explains that animals have feelings;  
4. Teacher explains the importance of not to litter, especially around beach. |

4. Conclusion

Flowchart and storyboard are useful means for creating interactive animation media, particularly in the preliminary stage. The interactive animation media in this study is designed to enable two-way communication between users and the media, as illustrated in the storyboards. The media is expected to enhance users’ multiple intelligences. Thus, eight storyboard frames are created, each designed for one type of intelligence. Teacher’s roles are also elaborated to assist students in using the media.

5. References

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