

# Developing Educational Mobile Game on Multicultural Learning for Elementary School

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**Abstract**

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Integrated multicultural learning is a learning approach that integrates various cultures from the various regional community. The multicultural teaching materials with the Indonesian theme are very much needed by schools. Teaching materials with the theme of the archipelago have not been developed by teachers, and teachers still refer to books from the government.

This paper aims to develop a mobile game application to support learning resources for children. In developing the application, the researchers conduct qualitative approaches Edugame Development consists of 6 stages: concept, design, production, lunch, maintenance. During the production stage, the game is developed using Adobe Animate with Action Script 3.0 programming.

It is hoped that the mobile game application would be easier, more fun, and interesting especially for children. This research is still ongoing and is aimed at ensuring that the mobile game application is an effective and feasible model to inform students about Indonesian culture.



## Multicultural education



Multiculturalism is a term which is used to describe the **social condition of diversity** among a specific population evident through various spatial formations, but particularly seen through the spatial lens of nation states and cities. .

Multicultural education is an idea, an educational reform movement, and a process. As an idea, multicultural education seeks to create **equal educational opportunities for all students**, including those from different racial, ethnic, and social-class groups.

It is an approach to education that aims to include all students, promote learning of other cultures, and teach healthy social skills in a **multicultural setting**.



# Implementation Multicultural Education



While this **blending of cultures** can most definitely be a blessing - it can also be a curse. With more diversity than ever, **teachers have to adjust methods** from one student to the next, and from one year to the next.



# What should teachers do?

There are several ways to encourage a real multicultural education in our schools:

- 1) Define multiculturalism
- 2) Observe the students closely, and value your real-life experience of diversity.

- 3) Learn students' learning styles
- 4) Encourage the students to be proud of their heritage
- 5) Be ware if the bias
- 6) Create an assignment



## Games

Using different activities and games in multicultural classrooms is an excellent way to **foster inclusivity** and **encourage students to share their heritage**.

Games are any **activity carried out for the sole purpose of pleasure** and without conscious purpose. **Every activity that brings pleasure is a game.**

Games are included in categories that include Chess, Checkers, Halma, Monopoly, Bridge, Jigsaw, etc. **The game is a game that has a rule (rule game).**



# Multicultural Education in Indonesia



As the largest archipelago in the world, Indonesia's **people have life in a diverse community.** Even so, the issue of multiculturalism is still **something new in Indonesia.**

Needs to rethink about its own **multicultural education concept.**

Describe of **historical view** of the emergence of multicultural education in Indonesia.



**Impact of social class** to an education field.



# Mobile game that is developed



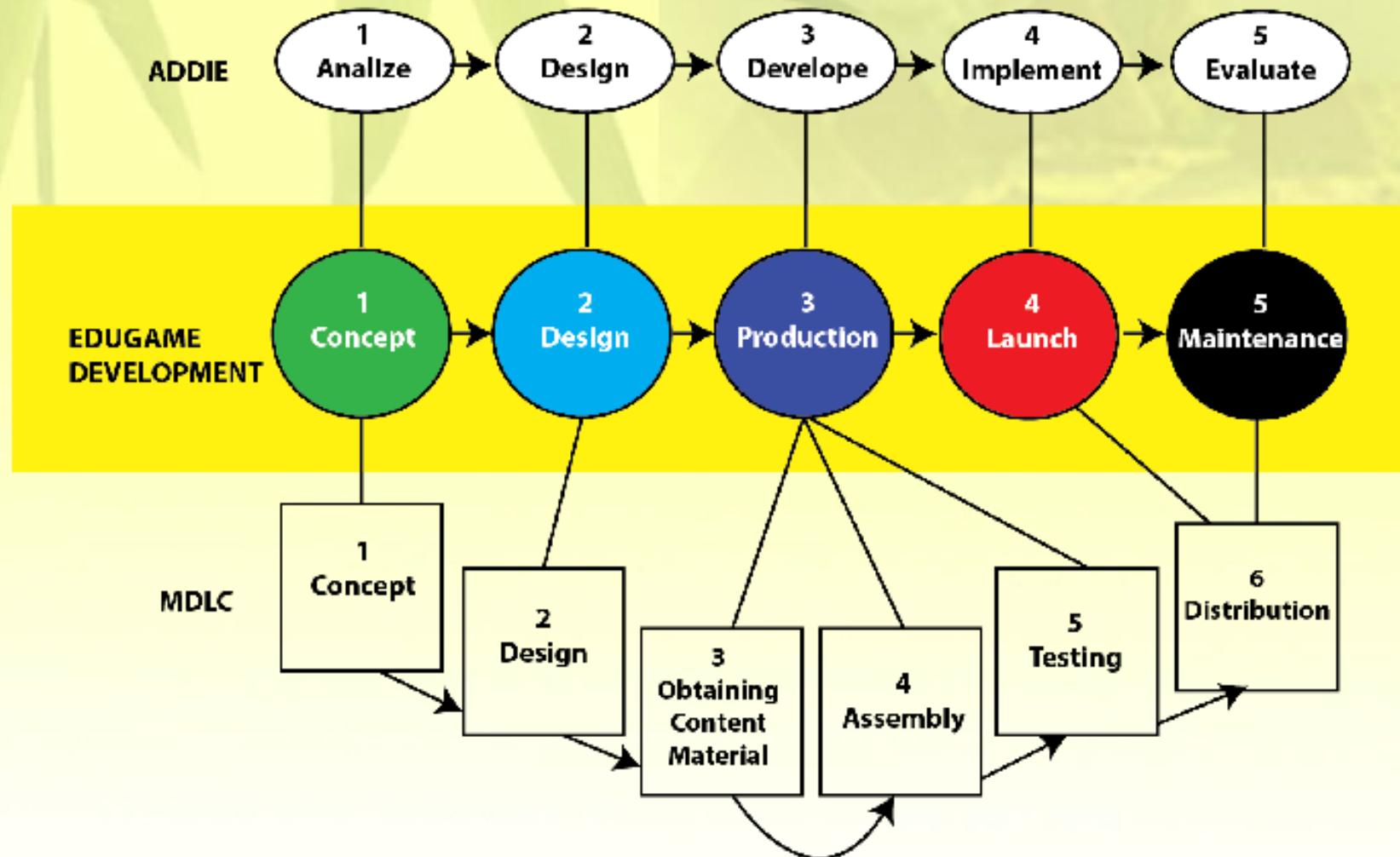
The mobile game that will be developed is the definition of simple. The goal is to introduce “**culture of traditional life of all regional people**” by displaying the houses, clothes, dances, etc.

The advantages of the mobile game are:

- Digital games can be delivered through **mobile devices**
- The fun game can be played many times by childrens, so **the content of message can be familiarized to be played and remembered**
- **Proud of Indonesian heritage**

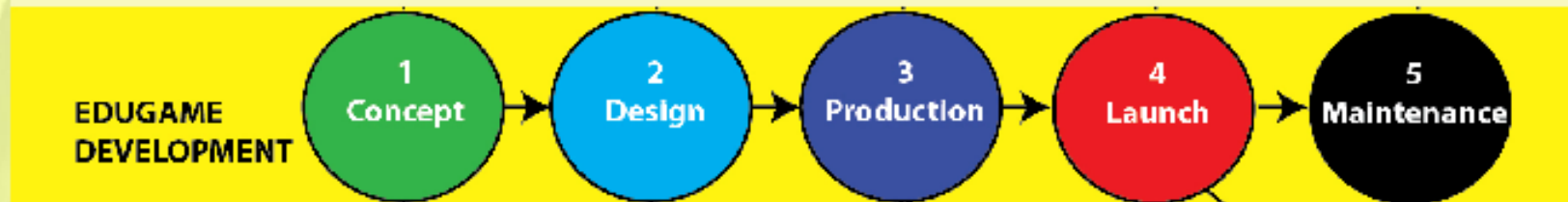


## Edugame Development



This study uses **Edugame Development**, a game development method that combines **ADDIE model** and **MDLC model**.





Edugame Development covers five phases, including:

### 1. **Concept**

The developer determines the learning concept, concept of the game, concept of a development team, and game genre that will be created;

### 2. **Design**

Creating learning designs: competencies, methods, teaching materials and learning strategies ( storytelling, visual design, navigation structure or site map), and algorithms

### 3. **Production**

Creating assets, game modules, integrating modules into a game, perform testing, and perform testing improvement

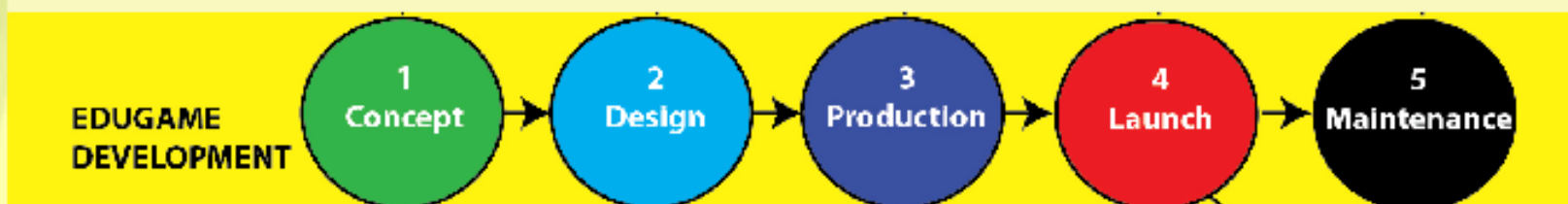
### 4. **Launch**

Making interesting look, enhances texture, and remove bugs;

### 5. **Maintenance**

At this stage developer teams identify and eliminate remaining bugs, make small changes as needed, and evaluating product use.





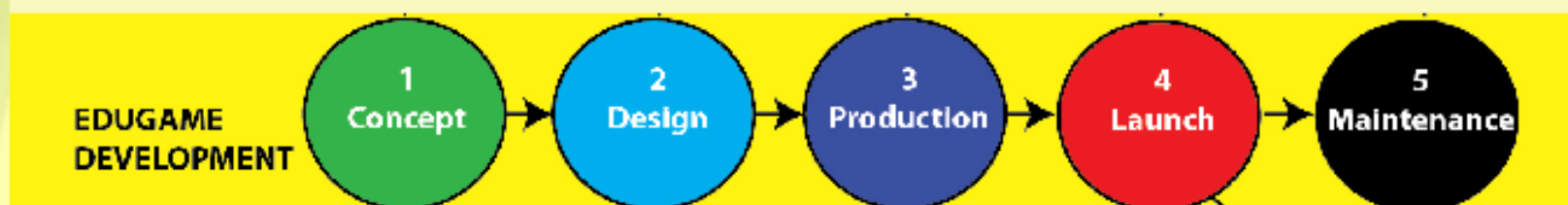
### Research Object

The object of the research is a **mobile game application**, and the research locations are some **elementary schools** in Jakarta.

### Respondents

Respondents of the research are:

- **students** and **teachers**
- **experts** who have experiences in social science, education, and computer science.



Collection of data is done using qualitative questionnaires and interviews:

1. **Questionnaires** filled by respondents is used to gather important information that is needed in **developing a mobile game** on how to adhere to the procedure when school resumes
2. Respondents can give **in-depth information** during interviews. The qualitative approach is used to collect **unlimited information** with many perspectives that are very important in developing a good product.  
Hence, respondents can give information that is **not limited to a different perspective**
3. Besides conducting the interview and collecting the questionnaires, observation should be done when **students are running the game**.

- A. Concept**
- Data collection was conducted using open-ended questionnaire and interview.
  - The respondents were teachers and children

TABLE I. Questionnaires and Answers of Teachers

No	Questionnaires	Answers
1	It is worth digital learning resources as an effective solution for managing children's thematic learning.	It is worth
2	Thera are many platforms to support learning resources. What platform do you most use?	<ul style="list-style-type: none"> <li>• Website</li> <li>• YouTube</li> <li>• Mobile devices</li> </ul>
3	Learning technology is growing to enhance education. How about using a mobile game to support your teaching?	Interesting and motivate children.
4	Can the mobile game application as a learning resource for students' cognitive development?	It can
5	It is worth building children's learning motivation stability through digital learning sources?	Agree.
6	What is your most used electronic device?	PC, mobile phone
7	Which social media platform do you use most often? .	WhatsApp
8	What kind of institutions do you acquire most learning information from?	<ul style="list-style-type: none"> <li>• Government</li> <li>• Association</li> <li>• Individual blog.</li> </ul>
9	Do the resources you got support the learning completely	No



TABLE II. Questionnaires and Answers of Students

No	Questionnaires	Answers
1	How do you find some learning resources?	<ul style="list-style-type: none"> <li>• Book</li> <li>• YouTube</li> <li>• Searching on Google</li> </ul>
2	Learning technology is growing with many kinds of tools. Do you know the mobile game application for education?	Just a little
3	How do you know the mobile game application?	From internet
4	How about using mobile game to support your learning?	It is nice
5	It is interesting to access a mobile game application containing Indonesian heritage?	Very interesting
6	Do you believe that a mobile game is interesting for getting to know geography, animals, houses, and more?	Sure
7	Are you familiar with Komodo Dragon in Indonesia as a world wonder animal?	Just a little
8	What is your most used electronic device?	Mobile phone, laptop
9	Which social media platform do you use most often?	WhatsApp



# Concept of mobile game

**User:** Children of Elementary School

<b>Topics:</b>	1. Opening page	<b>Game Level 1</b>
	2. Copyright page	1. East Nusa Tenggara Dance
<b>Learning</b>	<b>Learning</b>	2. House of East Nusa Tenggara
	1. Thematic Learning	3. Unique Animals
	2. Unique Animals in Indonesia	4. Feed of Komodo Dragon
	3. Three-colored Kalimutu Lake	<b>Game Level 2</b>
	4. Traditional Houses in Indonesia	1. Crosswords
	5. Traditional Clothes in Indonesia	2. Matching pictures
	6. Traditional Dances in Indonesia	3. Jigsaw Puzzle
7. Komodo Dragon	<b>Results</b>	


**Application:** Mobile game

**Object:** Text, images, animation, audio, video

**Interactivity:** Button, touch screen





## 2. Design Storyboard

Scene	Description
	<p><b>Scene 1 - Opening</b> Title: Nusantara Thematic Learning: East Nusa Tenggara <b>Object</b> Text: title Image: Map of Indonesia Audio: Song traditional music "Balelebo" <b>Interactivity</b> Button: Start, Exit <b>Description:</b> Player should click Start button to begin playing.</p>
	<b>Scene 2 - Copyright</b>

**Storyboards** was used to present the whole story of the application.



## 2. Design Storyboard

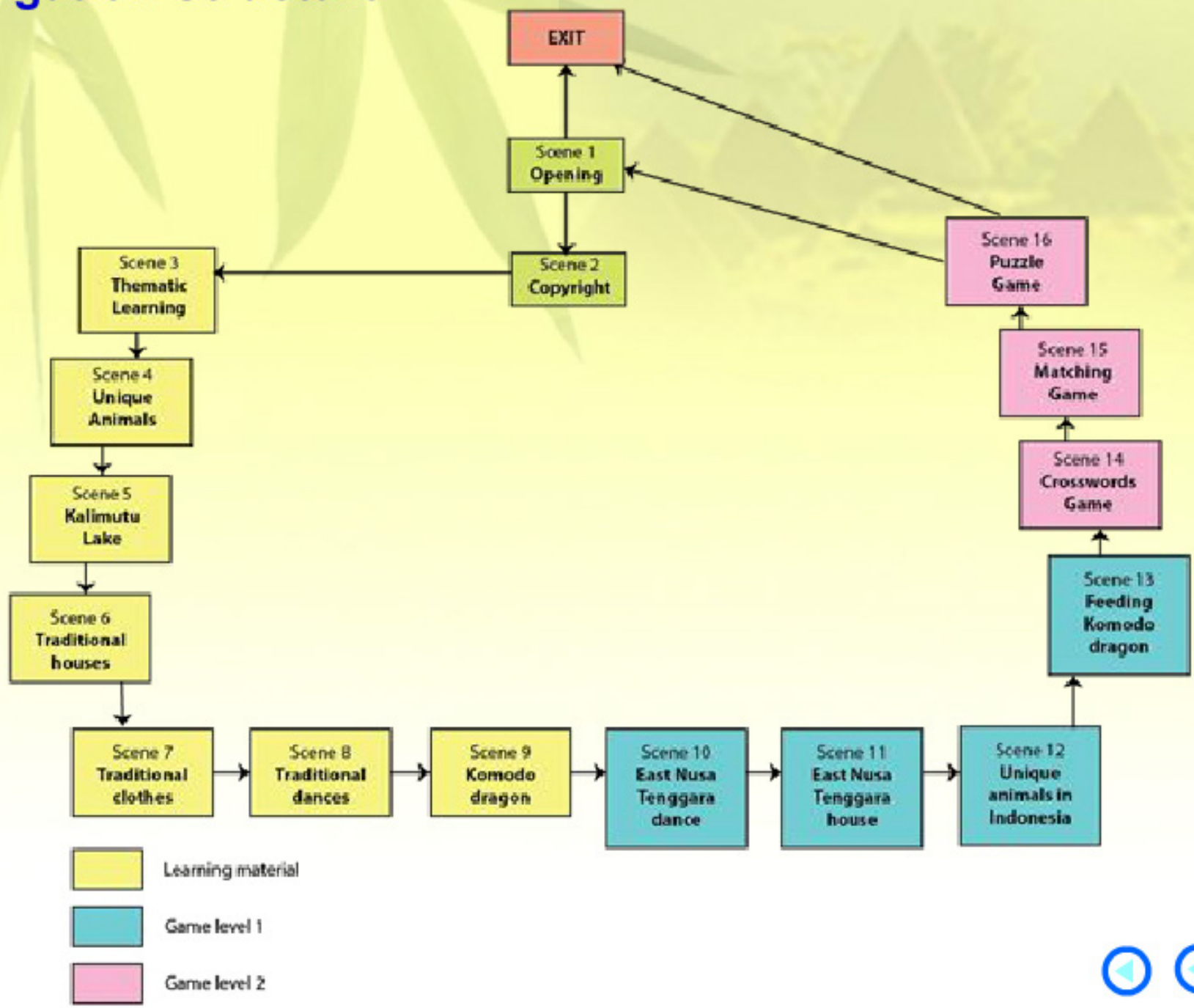
 <p>Image Storyboard</p>	<p><b>Scene 13 – Matching Game 1</b> Title: Komodo Dragon <b>Object</b> Text: Information how to run the game Image: Feeds, Komodo Dragon Audio: continued music <b>Interactivity</b> Button: Next, Back, draggable Komodo Dragon <b>Description</b> Player should select the islands where the animals live</p>
 <p>Image</p>	<p><b>Game Level 2</b> <b>Scene 14 – Crosswords</b> Title: Crosswords <b>Object</b> Text: How to run the game</p>



**Storyboards** was used to present the whole story of the application.



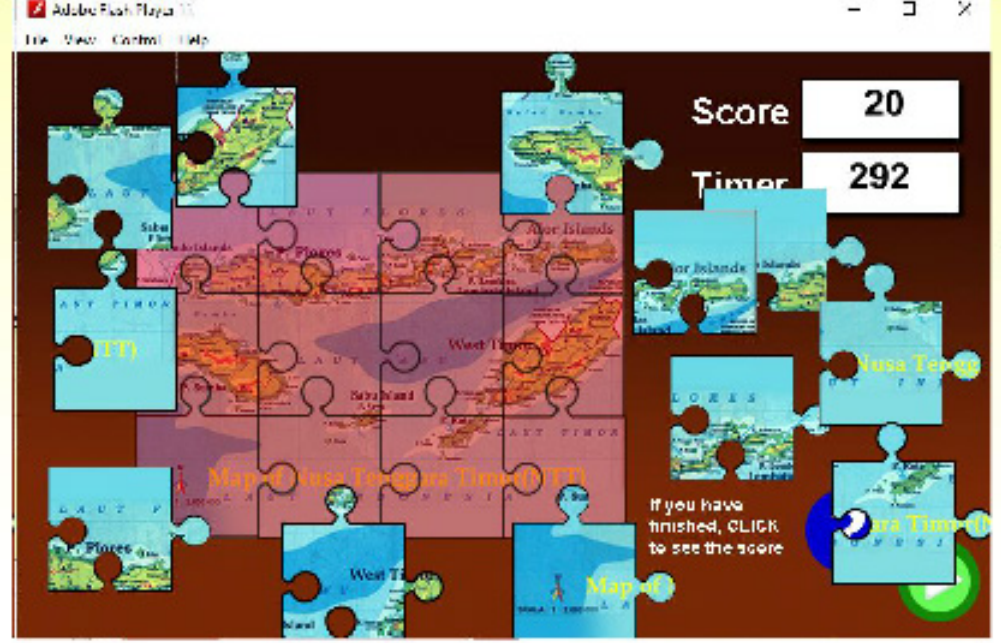
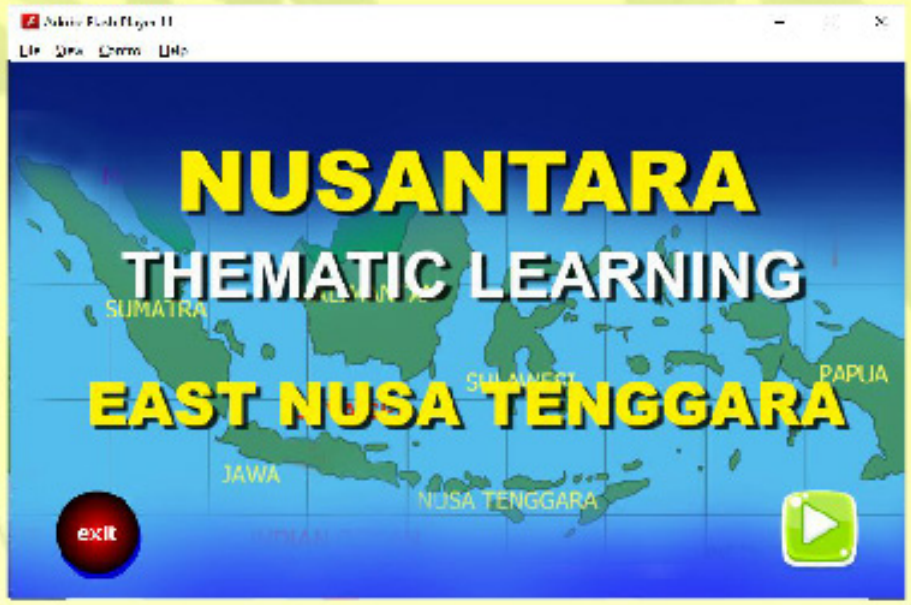
# Navigation Structure



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# 3. Production



- using Adobe Animate  
- ActionScript 3.0



## D. Testing

### **Individual testing**

Testing of all modules.

### **Respondent testing**

Testing of small groups

### **Expert evaluation**

The evaluation of preliminary game was conducted by subject matter expert in education, information technology, and social science.



## Testing

1. Most of respondents stated that the content was organized **well** and it should be enriched with the **new objects/ images**.
2. Most of respondents stated that the **backgrounds and text looked good**. It would be better if the **resolution of images could be improved**.
3. Most of respondents stated that the **flow of information was moderate**.
4. Most of respondents stated that the user can **access the application moderately**. The application could not be accessed using internet network. One of the experts was not sure if it would run on mobile phone using internet well without delay. **Audio and image should be synchronized**.
5. Unfortunately the application **cannot run on mobile device easily**. Some users **do not know how to install the file with APK** format on their mobile device.
6. The application **can be accessed anywhere** using internet network, unless the bandwidth is too low.
7. The application could be built in the APK format and published at **Play Store and AppStore**, so audience can download using their mobile phone easily.



# Limitation of Research

## Phase of Development

- Three phases have been conducted.
- The next phases are Launch and Maintenance

## Accesssing Game

- The users access the game through installing APK file directly.
- The application still has not existed in PlayStore

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# Conclusion

## Initial research

The information derived from the initial research is used as a guideline for developing mobile learning;

## Research method

The developing of mobile game based on Edugame Development that consists of 5 stages

## Expert evaluation

The first until fourth stage has been conducted. The research findings show that mobile game is a **model of multicultural learning that can be developed**

## Future activities

The mobile game model needs to be developed in the next stages, and released in Play Store and AppStore.



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*Thank You*

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