INTRODUCTION

BACKGROUND AND SIGNIFICANCE OF THE SELECTED TOPIC

• Develop an application that uses AR technology to motivate teenagers to learn about the story behind the Chinese New Year, aim to enhance the learning experience through AR.

• The participants of the survey will be randomly chosen from students at Xiamen University Malaysia.

• The results of the study
AR could bring positive effects to the education area. Cultural education is crucial in the process of inheriting tradition in human life.

Learning of culture involves many abstract concepts that are difficult to be explained simply by using text and images.

There is a lack of AR application of storytelling, especially in the Chinese culture filed.
Objectives:

- To identify the appropriate AR technology type for developing AR storytelling application.
- To develop the AR application based on the identified AR technology type.
- To evaluate users' motivation and satisfaction of using the application.

Scope:

- Only focused on the specific education area, the cultural one.
- Only use a portable, mobile electronic screen as a medium.
- Modules of the application will include marker-based scenes, engaging animation with great effect, and a way to motivate users to continue to explore the cultural animation.
LITERATURE REVIEW
LITERATURE REVIEW

- **Study on AR technology**
  - **Definition of AR**
    - Milgram’s definition (1995)
    - Azuma’s interpretation (1997)
  - **The relationship with Virtual Reality**
    - AR is evolved through VR
    - Overby’s research (2019)
  - **History of AR**
    - The first AR system (Sutherland, 1998)
    - Caudell and Mizell (1991) first proposal
Marker Based AR

- General Principle

- Why it is suitable for developing Nian Story AR application?
Augmented Reality in Education
Using AR in education ensures that users understand complex content in a more effective way, enhance engagement and support learning through immersive content.

AR Books
AR book is one of the most interesting educational applications that can be used in the education area.

Storytelling System for Augmented Reality Education
Storytelling through augmented reality will bring many benefits to education, and thus research in this area will help future educational innovations.

Multimedia Learning Theory
A scientific system that penetrates learning theory and teaching theory, revealing the cognitive mechanism of multimedia learning.
Three important principles
The background story of Monster Nian

- Its importance
- The story
RESEARCH METHODOLOGY

PART THREE
RESEARCH METHODOLOGY

Research Method  
Quantitative research method

Design Model  
waterfall model

Survey Method  
Questionnaires

Sampling Method  
Simple random sampling method

Statistical Method  
Descriptive Statistics method
RESEARCH METHODOLOGY

Samples
Teenagers from Xiamen University Campus. Participants will be randomly selected, the ideal number of sampled research participants was between twenty to thirty.

Questionnaires
1) Introduction; 2) General questions 3) Short introduction about AR technology;
4) yes-no questions related to the participant’s background information and use of AR technology;
5) Likert scales questions related to user acceptance, motivation, and satisfaction about “Nian Story AR” app.
waterfall model

For smaller projects, the Waterfall model is preferred to be chosen because of its simplicity and easy understanding.
RESEARCH METHODOLOGY

- Analysis
  - VARK Learning Styles inventory

- Design
  - Design concept
  - Conceptual Model
RESEARCH METHODOLOGY

- Development
  - Initial development workflow

- Testing Phase
- Implementation
- Maintenance

- Download and install Unity
- Register Vuforia, manage licence and import images to database
- Collect models and produce animation in Maya and Mikkamo
- Design scene in Unity
- Implement
- Testing the detection effect and refined the project
- Build AR app (including UI, AR scene, sound effect, VFX effect)
- Manage animation with timeline system in Unity
IMPLEMENTATION

PART FOUR
IMPLEMENTATION

Tools used

- Auto Desk Maya
- Unity
- Photoshop
- Vuforia Augmented Reality SDK.
IMPLEMENTATION

Storyboard
IMPLEMENTATION

UI design

Start Menu and Introduction Menu

Scan Image Indicator
IMPLEMENTATION

AR content

Chinese New Year (Spring Festival) is the oldest traditional festival in China, but only few people know the origin and story behind the holiday. Many existing customs and activities of the festival can be traced back to a popular story of the Monster Nian, which helps to explain why and how the festival is celebrated.

AR Physical book content

Environment design
IMPLEMENTATION

Animation

Maya animation

Timeline system
IMPLEMENTATION

Scripts

virtual button script

AR detection script
RESULTS AND DISCUSSIONS

PART FIVE
RESULTS AND DISCUSSIONS

Data Analysis

In this questionnaire survey, we received 28 responses, which are in line with our expected value. Excluding unforeseen factors, the results of this survey are authentic and informative.

Likert scales (five-point based)
## RESULTS AND DISCUSSIONS

### Analysis of results

<table>
<thead>
<tr>
<th>General Questions</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>User’s Nationality is China</td>
<td>35.7%</td>
</tr>
<tr>
<td>User’s Nationality is Malaysia</td>
<td>46.4%</td>
</tr>
<tr>
<td>User’s Nationality is other country</td>
<td>17.9%</td>
</tr>
<tr>
<td>User is male</td>
<td>57.1%</td>
</tr>
<tr>
<td>User is female</td>
<td>42.9%</td>
</tr>
<tr>
<td>User is 18 years old and below</td>
<td>7.1%</td>
</tr>
<tr>
<td>User is 19-21 years old</td>
<td>71.4%</td>
</tr>
<tr>
<td>User is 22-24 years old</td>
<td>21.4%</td>
</tr>
<tr>
<td>User is 25 years old and above</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Background information Questions</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users already know what AR is before this study</td>
<td>60.7%</td>
</tr>
<tr>
<td>Users have experience in AR-based learning</td>
<td>28.6%</td>
</tr>
<tr>
<td>Users heard about the AR book before this study</td>
<td>39.3%</td>
</tr>
<tr>
<td>Users know the story behind the Chinese New Year</td>
<td>39.3%</td>
</tr>
<tr>
<td>Users interested in learning Chinese traditional story</td>
<td>92.9%</td>
</tr>
</tbody>
</table>
RESULTS AND DISCUSSIONS

Analysis of results

• Overall, Nian Story AR successfully improved the satisfaction of learning traditional Chinese culture, if improve 3D effects, we will receive more satisfaction. Such results answer the research question that the Nian Story AR successfully improve both motivation and satisfaction of learning traditional Chinese culture.

<table>
<thead>
<tr>
<th>Likert scales Questions</th>
<th>Result (Strongly agree)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using Nian Story AR may increase user’s interest in learning Chinese traditional story.</td>
<td>89.3%</td>
</tr>
<tr>
<td>Using Nian Story AR may cultivate my curiosity in learning.</td>
<td>67.9%</td>
</tr>
<tr>
<td>Using Nian Story AR may give user a deep understanding of Chinese traditional story.</td>
<td>60.7%</td>
</tr>
<tr>
<td>Using Nian Story AR may enhance user’s learning motivation.</td>
<td>71.4%</td>
</tr>
<tr>
<td>I feel that Nian Story AR gives me a lot of satisfaction in watching the animation of Nian story.</td>
<td>82.7%</td>
</tr>
<tr>
<td>User is satisfied with the 3D visual effects implemented by Nian Story AR app.</td>
<td>71.4%</td>
</tr>
<tr>
<td>User enjoy watching Chinese traditional story: the legend of Nian through this app.</td>
<td>67.9%</td>
</tr>
<tr>
<td>User is satisfied with what I have learned from using Nian Story AR for watching the story.</td>
<td>67.9%</td>
</tr>
<tr>
<td>User is satisfied with the concept that using AR to present the story.</td>
<td>67.9%</td>
</tr>
<tr>
<td>The goal for Nian Story AR app for conveying the immersive story is accomplished.</td>
<td>64.3%</td>
</tr>
<tr>
<td>User think using Nian Story AR app for learning Chinese traditional culture is better than the standard learning method (including books, videos).</td>
<td>60.7%</td>
</tr>
</tbody>
</table>
The entire research and development of Nian Story AR that can convey Chinese cultural stories received positive feedback can be used as a design reference for future Marker-based AR applications. Encourage the development of more similar applications to enhance the user motivation and satisfaction of other learning material.

The results of this study demonstrate the feasibility of using AR for immersive storytelling, adding to previous research using AR education tools to measure teenager's learning motivation. This study will promote the development of AR technology in the education field.
CONCLUSION

- Review the entire research process
- The result and its contribution
- Limitation of study and future recommendation
Thanks for your listening!

XIAMEN UNIVERSITY MALAYSIA