



METaverse EDUCATIONAL GAME RECOGNITION OF ANIMAL VOICES IN 3 LANGUAGES FOR CHILDREN'S EDUCATION

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Abstract

The use of technology, especially smart phones, computers and others is growing rapidly in everyday life. There are various reasons why people are interested in using this device, including its lightweight and practical nature [1]. In addition, the available game features not only provide entertainment but also help develop thinking and logical skills. Now technological developments are increasingly driving the emergence of changes in all aspects, one of which is in the field of education where developments can be seen in the use of learning media equipment which is marked by the formation of the concept of educational games which can make learning more interesting and easily accessible, especially for children during important developmental periods. they. A method can refer to a path or a method that must be adopted to reach a certain goal. With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium at Pertiwi Sariak Laweh Kindergarten Based on Android, it can be a fun way to learn about animals. With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium in Android-based Pertiwi Sariak Laweh Kindergarten can provide information related to animals. With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium at Pertiwi Sariak Laweh Kindergarten Based on Android, it can overcome game addiction in children so that it becomes a useful activity.

Keywords: Educational Game, Android, Waterfall, Artificial Inteligent, Multimedia

1. Introduction

The use of technology, especially smart phones, computers and others is growing rapidly in everyday life. There are various reasons why people are interested in using this device, including its lightweight and practical nature [1]. In addition, the available game features not only provide entertainment but also help develop thinking and logical skills. Now technological developments are

increasingly driving the emergence of changes in all aspects, one of which is in the field of education where developments can be seen in the use of learning media equipment which is marked by the formation of the concept of educational games which can make learning more interesting and easily accessible, especially for children during important developmental periods. they. Educational games have a specific purpose of educating

which prioritizes supporting the learning process with the concept of playing while learning. For some children the word learning will be very scary, so it is hoped that with this interesting educational game, children will not realize that what they are doing is included in learning and children will be happy and willing to learn [2]. From this explanation, the author wants to design and create educational games for children that can be learned anytime anywhere with a smartphone.

2. Theoretical Basic

A. Educational Game

Educational games are games that are made to stimulate thinking power includes increasing concentration and solving problems. Games Education is made to have a special purpose of education (education). This educational game will prioritize to support the learning process with the concept playing while studying. For some children, the word learning will be felt very scary, so that is expected with an interesting educational game In this case, the child will not realize that what he is doing includes learning and children will be happy and willing to learn [3].

B. Android

Android is a mobile operating system based on modified versions of the Linux kernel and other open source tools. Android is designed for mobile devices especially touch screens such as smartphones and tablets. The operating system was first launched in September 2008, where Android was developed by the Open Handset Alliance which was commercially sponsored by Google [4].

C. Waterfall Model

The waterfall model is a software development model that most frequently used. This development model is linear from the initial stage system development, namely the planning stage to the final stage system development, namely the maintenance stage. The next stage will not carried out before the previous stage was completed and could not return or repeat to the previous stage. SDLC model waterfall (waterfall) often called a linear sequential model (sequential linear) or life cycle classic (classic life cycle). The waterfall model provides a live flow approach software sequentially or sequentially starting from analysis, design, coding, testing, and support stages [5].

3. Research Methods

Research methods are essentially a scientific way of gaining information with a specific purpose and purpose. Research methods are a way that researchers use to collect data from their research. The scientific way meant that this study was based on the scientific characteristics of rational, empirical, and systematic. A method can refer to a path or a method that must be adopted to reach a certain goal

A. Research Framework

The framework of research is the stages by which the author completed the research. These steps are done by structured writers from beginning to end and thus can be obtained results from these studies. As for this research framework it can be described as Figure 1.

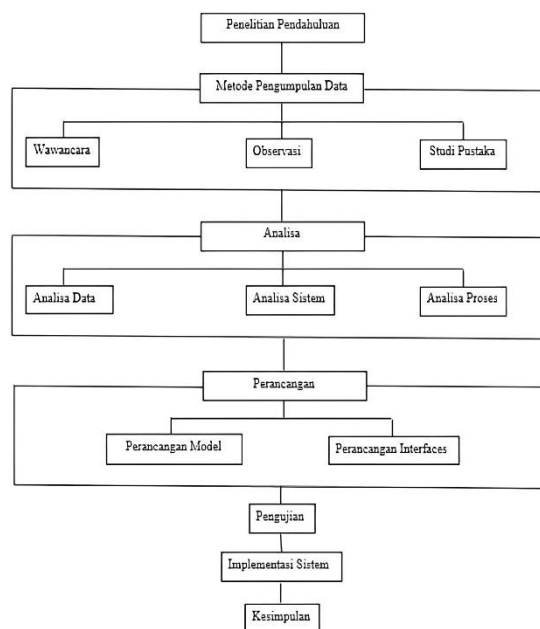


Figure 1. Framework Research

B. Waterfall Method

The waterfall method is a software development model that is analogous to a waterfall, where each stage is done sequentially from top to bottom. There are 5 stages of the waterfall method, namely requirement analyst, design, implementation, testing and maintenance [5].

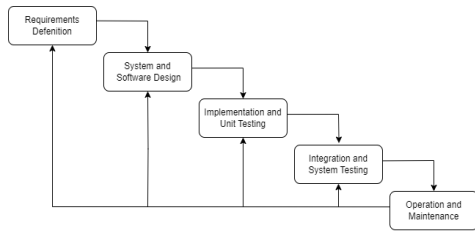


Figure 2. Waterfall Method

4. Results and Discussion

A. Designing

At the design stage, a mapping process will be described that can be implemented by the game being developed. The goal of this stage is to ensure that the application design is detailed, usable, easy to understand, efficient and effective. The author wants to design a game that can help children to get to know the names of animals and also their habitat in 3 languages and is also equipped with educational games on it, a picture stacking game and guessing the sound of animal. First is the design of the main menu which is the primary menu in the game. In this menu there are several menus such a introduce, play, others, and menu exit.

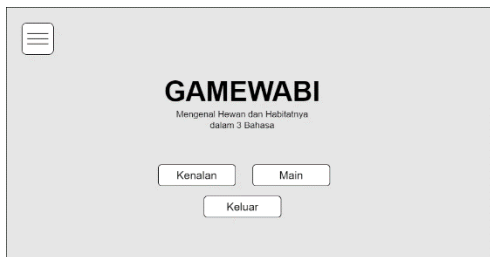


Figure 1. Main Menu

The button can be pressed and move to the next destination menu with the following code.

```

using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class tombol : MonoBehaviour
{
    // Use this for initialization
    void Start()
    {
    }
    public void scene(string scene)
    {
        Application.LoadLevel(scene);
    }
    public void scale(float scale)
    {
        transform.localScale = new Vector2(1 / scale, 1 * scale);
    }

    // Update is called once per frame
    void Update()
    {
    }
}
  
```

Then the design for the Introduce menu which consists of images and backgrounds of the animal sounds, and voice in 3 languages.



Figure 2. Introduces Menu

The voice languages will play when the button languages is pressed, the following code is used for the implementation.

```

using System.Collections.Generic;
using UnityEngine;

public class tombol : MonoBehaviour
{
    // Use this for initialization
    void Start()
    {
    }
    public void scene(string scene)
    {
        Application.LoadLevel(scene);
    }
    public void scale(float scale)
    {
        transform.localScale = new Vector2(1 / scale, 1 * scale);
    }

    // Update is called once per frame
    void Update()
    {
    }
}
  
```

Play selection menu is a menu to choose which game the user will play. It consists of 2 buttons, the picture stacking game and guessing the sound.

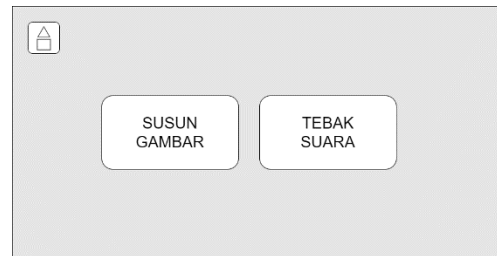


Figure 3. Play Selection Menu

There are 2 games in it, stacking pictures and guessing the sound.

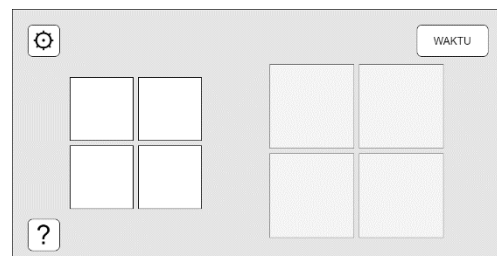


Figure 4. Stacking Pictures Game

To play this stacking picture game you have to match the picture with the box provided. If the image is in accordance with the order then the image will stick but if not the box will reject.

This game also has a time limit. The following code is for the time limit.

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.UI;

public class Timer : MonoBehaviour
{
    public Text TextTimer;
    public float Waktu;
    public bool GameAktif = true;
    public GameObject kalah;
    void SetText()
    {
        int Menit = Mathf.FloorToInt(Waktu / 60);
        int Detik = Mathf.FloorToInt(Waktu % 60);
        TextTimer.text = Menit.ToString("00")+":"+Detik.ToString("00");
    }
    float s;
    private void Update()
    {
        if (GameAktif)
        {
            s += Time.deltaTime;
            if (s >= 1)
            {
                Waktu--;
                s = 0;
            }
        }
        if (GameAktif && Waktu <= 0)
        {
            kalah.SetActive(true);
            GameAktif = false;
        }
        SetText();
    }
}
```

To play this guessing the sound game is almost the same as stacking pictures. And also this game has a time limit to complete same as the stacking picture game. If the user chooses an animal image that matches the sound that appears, the score will increase by 10. If the user has wrong answers the heart will decrease until game over.

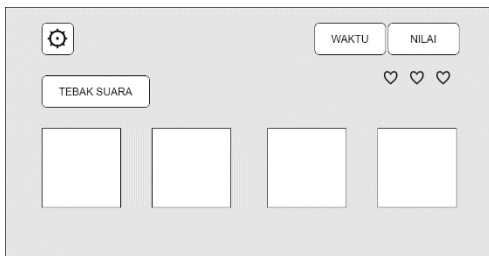


Figure 5. Guessing the sound Game

The following code is for the heart.

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;
using UnityEngine.UI;

public class Nyawa : MonoBehaviour
{
    public GameObject[] nyawa;
    public GameObject kalah;
    private int Life;
    private bool dead;
    private void Start()
    {
        Life = nyawa.Length;
    }
    // Update is called once per frame
    void Update()
    {
        if (dead == true)
        {
            kalah.SetActive(true);
        }
    }
    public void TakeDamage(int d)
    {
        if (Life >= 1)
        {
            Life -= d;
            Destroy(nyawa[Life].gameObject);
            if (Life < 1)
            {
                dead = true;
            }
        }
    }
}
```

Lastly, the exit menu comes out when the user press the button. Exit menu is used to exit the game when it has finished playing. If the user presses the button, a dialog box will appear containing 2 button, "Yes" and "No". If the user press the "Yes" button the game will exit.

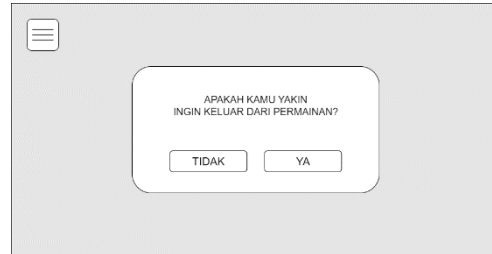


Figure 6. Exit Menu

Here's the code so the exit button can work.

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class Startmenu : MonoBehaviour
{
    public void exit() {
        Application.Quit();
    }

    public void sound_volume(float volume)
    {
        PlayerPrefs.SetFloat("volume", volume);
    }
}
```

B. Testing

Testing Implementation of the system is a system that the user is prepared to use. Before it is directly implemented, it needs to be tested first to see if the system is properly run and also a live test of how to run the system for the user.

The Main Menu is display after the Splash Screen has finished displaying, where in this view the user can access existing menus such as introduce menu, play menu, others and exit which is described as Figure 7.



Figure 7. Main Menu

In the Introduce Menu, users can see material about animals that have been provided, such as animal pictures, animal names in 3 languages (Minang, English, Indonesian), animal sounds, and also where the animal's habitat is as shown in the picture. which is described as Figure 8.



Figure 8. Introduce Menu

After viewing material about animals on the play menu, the user can proceed to select the game about animals that has been provided, namely the picture stacking and guessing game. which is described as Figure 9.



Figure 9. Play Menu

In this menu the user can play the game by matching random pictures according to the order. Here there is also a time limit to complete the game which is described as Figure 10.

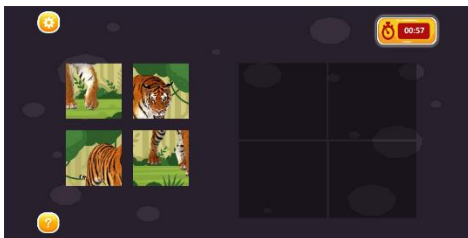


Figure 10. Picture Stacking Game

In this menu the user can play the game by determining the appropriate animal image based on the sound of the animal. There is a time limit in completing the game and the heart-shaped health is reduced if the user chooses the wrong picture from the animal's voice. The score will increase by 10 if the user successfully determines the image correctly which is described as Figure 11.



Figure 11. Sound Guessing Game

After the user has finished using the game, the user can exit the game by clicking the exit menu then a dialog box will appear containing the "Yes" and "No" buttons, if the user presses the "Yes" button then the user will exit the application which is described as Figure 12.



Figure 12. Exit Menu

5. Conclusion

With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium at Pertiwi Sariak Laweh Kindergarten Based on Android, it can be a fun way to learn about animals.

With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium in Android-based Pertiwi Sariak Laweh Kindergarten can provide information related to animals.

With an educational game that recognizes the names of animals and their habitat in 3 languages as a learning medium at Pertiwi Sariak Laweh Kindergarten Based on Android, it can overcome game addiction in children so that it becomes a useful activity.

References

- [1] Widiastika, M. A., Hendracipta, N., & Syachruroji, A. (2020). Development of Android-Based Mobile Learning Learning Media on the Concept of the Circulatory System in Elementary Schools. *Basicedu Journal*, 5(1), 47–64. <https://doi.org/10.31004/basicdu.v5i1.602>
- [2] Widyastuti, R., & Puspita, L. S. (2020). Development of Educational Game-Based Learning Media in the Thematic Science MatPel of Environmental Cleanliness. *Paradigm - Journal of Computers and Informatics*, 22(1), 95–100. <https://doi.org/10.31294/p.v22i1.7084>
- [3] Panjaitan, R. G. P., Titin, T., & Putri, N. N. (2020). Educational Game-Based Interactive Multimedia as

- Learning Media for Respiratory System Material in Class XI SMA. *Indonesian Journal of Science Education*, 8(1), 141–151. <https://doi.org/10.24815/jpsi.v8i1.16062>
- [4] Aliman. (2021). SOFTWARE DESIGN FOR DRAWING DIAGRAMS BASED ON ANDROID. *Indonesian Scientific Journal*, 6(6), 3091-3098. <http://dx.doi.org/10.36418/syntax-literate.v6i6.1404>.
- [5] Pricillia, T., & Zulfachmi. (2021). Comparison of Software Development Methods (Waterfall, Prototype, RAD). *Indonesian Awakening Journal*, 10(1), 6–12. <https://doi.org/10.52771/bangkitindonesia.v10i1.153>
- [6] Putra, F. D., Riyanto, J., & Zulfikar, A. F. (2020). WEB-based Asset Management Information System Design at Pamulang University. *Journal of Engineering, Technology, and Applied Science*, 2(1), 32–50. <https://doi.org/10.36079/lamintang.jetas-0201.93>
- [7] Ramadhona, E. W., Prasetya, T., Purnamasari, A. I., Dikananda, A. R., & Nurdiawan, O. (2022). Educational Game “Nihongo Kurabu” Learns Languages Using Android-Based Unity 2d. *INFORMATION MANAGEMENT FOR EDUCATORS AND PROFESSIONALS: Journal of Information Management*, 6(1), 71. <https://doi.org/10.51211/imbi.v6i1.1684>
- [8] Hingide, M. N., Mewengkang, A., & Munaiseche, C. P. C. (2021). Development of Interactive Multimedia-Based Learning Media for the Android Platform in Civics, Vocational High School Subjects. *EduTik: Journal of Information and Communication Technology Education*, 1(5), 557–566. <https://doi.org/10.53682/edutik.v1i5.2922>
- [9] Andrian, R., Ardiansyah, A., & Fitria, M. (2020). Prototype Design of Information Application for Wedding Building Tenants in Banda Aceh. *Journal of Computers, Information Technology, and Electrical Engineering*, 5(1), 19–27. <https://doi.org/10.24815/kitektro.v5i1.15573>.
- [10] Pane, W. P., Herawati, S., & Amelia, P. (2023). DEVELOPMENT OF GAME-BASED MATHEMATICS LEARNING MEDIA USING ADOBE ANIMAT E FOR VOCATIONAL SCHOOL STUDENTS DEVELOPMENT O GAME-BASED LEARNING MEDIA USING ADOBE ANIMATE FOR VOCATIONAL HIGH SCHOOL STUDENTS. 9(1), 37–45. <https://doi.org/10.36987/jpms.v9i1.3662>