

## **ENGLISH CROSSWORD PUZZLE GAME APPLICATION FOR CHILDREN BASED ON WEBSITE**

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### **Abstract**

*English is the most language widely used in communicating internationally and it will be easier for children learn it from an early age. However, generally children have difficulty in learning a foreign language, especially English. Therefore, a fun learning method is needed. The method which is most favoured by children is by applying learning English using a game method. This research aims to analyse the impact of using of website-based education application for improving English towards children. By using waterfall method, this research was conducted to find out the results. The game created will run on an Android-based smartphone. The result exhibited that Website-based education application is able to be used to help children learn English. Another result also show how English education application can help support the memory of children who are still very much sensitive to what is seen. With the help of pictures, children will learn quickly.*

**Keywords:** Children, games, websites

### **Abstrak**

Bahasa Inggris adalah bahasa yang paling banyak digunakan dalam berkomunikasi secara internasional dan akan memudahkan anak-anak mempelajarinya sejak usia dini. Namun, umumnya anak-anak mengalami kesulitan dalam mempelajari bahasa asing, khususnya bahasa Inggris. Oleh karena itu, diperlukan metode pembelajaran yang menyenangkan. Metode yang paling disukai oleh anak-anak adalah dengan menerapkan pembelajaran bahasa Inggris menggunakan metode permainan. Penelitian ini bertujuan untuk menganalisis dampak penggunaan aplikasi pendidikan berbasis website untuk meningkatkan bahasa Inggris pada anak-anak. Dengan menggunakan metode waterfall, penelitian ini dilakukan untuk mengetahui hasilnya. Game yang dibuat akan dijalankan pada smartphone berbasis Android. Hasil penelitian menunjukkan bahwa aplikasi pendidikan berbasis website dapat digunakan untuk membantu anak-anak belajar bahasa Inggris. Hasil lain juga menunjukkan bagaimana aplikasi pendidikan bahasa Inggris dapat membantu mendukung daya ingat anak-anak yang masih sangat peka terhadap apa yang dilihat. Dengan bantuan gambar, anak akan belajar dengan cepat.

**Kata kunci:** Anak-anak, game, website

### **Introduction**

Language is a tool used for communication, English is the most language widely used in communicating

internationally. English will be easier to teach to children from an early age. However, in general children have

difficulty learning foreign languages, especially English.

Therefore a fun learning method is needed, contextual, effective, efficient, and meaningful. The choice of a learning method aims to facilitate the implementation of learning activities, so that learning objectives can be achieved with and good and maximum results.

A game or game is a system where players are involved in a conflict artificial, here players interact with the system and conflict in the game which is engineering or artificial, in the game there are rules that aim to limit the behavior of players and determine the game.

Games are actually important for brain development, to improve concentrate and train to solve problems correctly and quickly because in the game there are various conflicts or problems that require us to solve them quickly and precisely. The means of learning English with the game method is one innovation that are much favored by early childhood, where children at an early age are still very much love to play.

So from that it would be nice if a child's play was played educating children as a means to learn and because games can also develop work performance the brain of a child or someone.

One of the games is English crossword puzzle. It can help people to enrich English vocabulary. As stated by Nickerson (2011), success at crossword puzzles taxes several aspects of memory and cognition. When playing it, some clue types are available, such as: [1] semantic clues - sometimes it can be a declarative-knowledge clues that suffice to identify the target word precisely if the puzzle doer has the requisite knowledge, or it can be a word associates, that words are associatively linked to each other to varying degrees is a very old idea in psychology, or it can be specific letters in specific positions, specific letter clues are

discovered as a puzzle is partially filled in; [2] thematic theme - often a puzzle has a theme that is reflected in several of its target words and such themes can be practically anything—puns, witticisms, movie titles, names of politicians,...it may be given explicitly in the puzzle title, or it may have to be discovered.

This application is intended for children aged 7 -12 years.

Based on the background above, then in writing this report, the authors took the title "English Crossword Puzzle Game Application for Children based on Website."

## **Writing Method**

The research method used is the Waterfall method based on Royce that has been cited in Sage (1992), the method has the following steps: [1] system requirement - system services, constraints, and objectives are determined by observations which are then defined in detail and function as system specifications; [2] analysis - with SWOT analysis, look for Strengths, Weaknesses, Opportunities, Threats; [3] design - at this stage, software design is realized as a series of programs or unit programs; [4] integration and system testing - the individual units of the program or program are combined and tested as a complete system to determine whether or not it matches the software requirements. After testing, software can be sent to the customer; [5] operation and maintenance - maintenance involves correcting errors not found in the previous stages, increasing the implementation of the unit system, and improving system services as new needs and increasing the quality of applications developed by adding new features that will facilitate access by analyzing the development of information technology.

For modeling the design, the authors design it using UML (Unified Modeling Language) as the given example by Bell (2003). One of the purposes of UML was to

provide the development community with a stable and common design language that could be used to develop and build computer applications (Bell, 2003). Yet it does provide several types of diagrams that, when used within a given methodology, increase the ease of understanding an application under development (Bell, 2003).

Bell (2003) mentions the most useful, standard UML diagrams are: [1] use case diagram, illustrates a unit of functionality provided by the system and the main purpose of the use-case diagram is to help development teams visualize the functional requirements of a system, including the relationship of "actors" (human beings who will interact with the system) to essential processes, as well as the relationships among different use cases; [2] class diagram, shows how the different entities (people, things, and data) relate to each other; in other words, it shows the static structures of the system; [3] sequence diagram, shows a detailed flow for a specific use case or even just part of a specific use case and they are almost self-explanatory; they show the calls between the different objects in their sequence and can show, at a detailed level, different calls to different objects; [4] statechart diagram, models the different states that a class can be in and how that class transitions from state to state; [5] activity diagram, shows the procedural flow of control between two or more class objects while processing an activity; [6] component diagram, provides a physical view of the system and its purpose is to show the dependencies that the software has on the other software components (e.g., software libraries) in the system; and [7] deployment diagram, shows how a system will be physically deployed in the hardware environment and its purpose is to show where the different components of the system will physically run and how they will communicate with each other.

## **Result and Discussion**

### **System requirement**

#### 1. Functional

##### a. User

Users as application users intended for learning English with the method of learning "games" on the website, the system in the user:

- Login
- Edit username
- Edit Password
- History
- Level

##### b. Admin

- As the owner and manager of the website
- Add new data or updates
- Control events on the application
- Admin can change User data with the user's permission

#### 2. Non-functional

Hardware specifications:

##### a. Client

- Can Open Websites using all browser application include: Microsoft Edge, Mozilla Firefox, Chromium, Safari, Internet Explorer, Torch, etc.
- Can open websites in all PC/notebook/smartphone/android specification.

##### b. Server

- CPU Intel cover 17-8200U (4,2GHz 6MB 1,5 cache)
- Cache 32GB
- Mouse, keyboard
- Monitor LED LG 25UM8-P IPS, Resolution 2160 x 1440
- Internet connection Broadband IPV6 up to 100MBPS
- Hard Disk 2T

## **Analysis**

1. There are children aged 7 - 12 years playing the crossword puzzle game, when they make a tutorial there will be

someone who understands right away and there is a child who must understand until they can

- The system must evaluate each answer given by the user so that the user can understand the mistakes
- They made many children / users often close websites without logging out

Table 1  
Sample of User Data

Age	Name	Education Level
7	Dellon	Elementary School
8	Dequan	Elementary School
9	Tyler	Elementary School
10	Tfue	Elementary School
12	Mongrall	Junior High School

### Design stage

Design using UML (Unified Modeling Language).

- Use Case Diagram

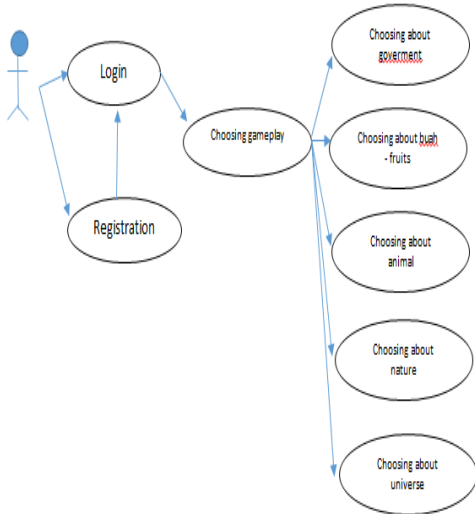


Figure 1  
Case Diagram

- Activity Diagram

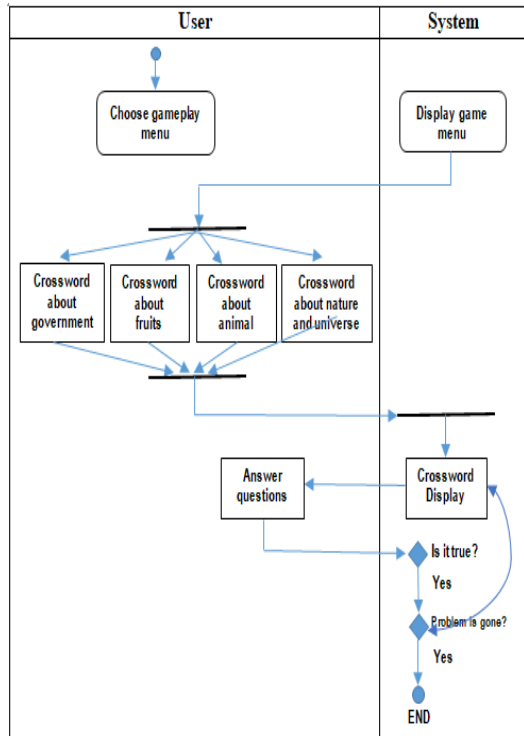


Figure 2  
Activity Diagram

### Application design

- Tutorial

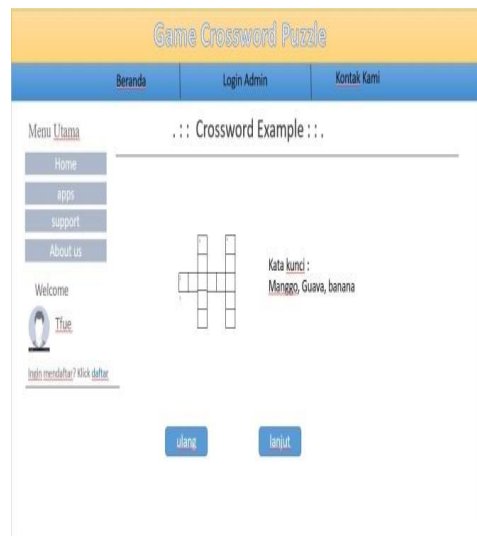


Figure 3  
Tutorial Page

Figure 1 shows an example for the tutorial, there is an example of a

crossword puzzle and there is an advanced and reset button, so if you don't understand it can be repeated.

## 2. Gameplay page

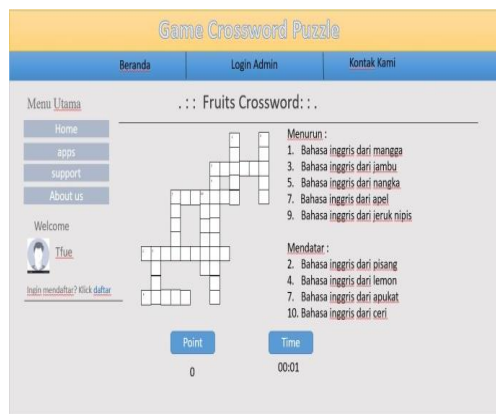


Figure 4  
Gameplay Page

In accordance with the Figure 2 where the crossword puzzle game will display the crossword according to the crossword frequency options chosen by the user, the user will be presented with a total of 10 questions, if use can answer 1 question correctly then the user will get 10 points out of 100 points. However, if they answer the wrong one there will be a warning like Figure 3 below:

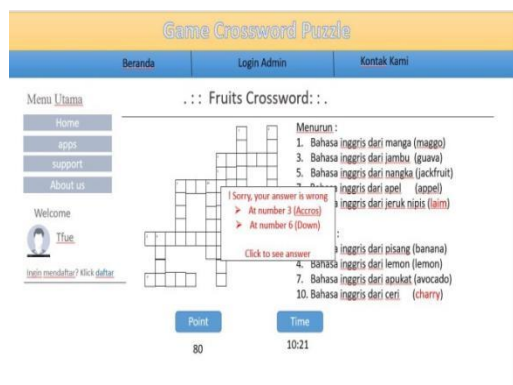


Figure 5  
The Warning of Gameplay Page  
Here are the results of the gameplay:

Table 2  
The Results of the Gameplay

Age	Name	Point	Time	Pause/complete
7	Dellon	20	1:20:15	Pause
8	Dequan	100	05:55	Complete
9	Tyler	60	05:12	Pause
10	Tfue	80	01:19	Complete
12	Mongrall	100	02:41	Complete

## 3. Login/registration page



Figure 6  
Login/Registration Page

## Implementation stage

### 1. Gameplay page implementation

This page is like a home page, but the difference is where this page users can see the account and choose the type of crossword according to the choice of the user, where we take the example for example children aged 7-12 years to try this website. This page has a menu:

- Account, which contains:
  - Username
  - Password
  - History
- Profile picture
- The crossword game
- Selected crossword game
- Point
- Time

For example, where children will be given a tutorial on how to answer crosswords with various guides, with various steps to make children understand how this game works.

2. Login/registration page implementation  
This page is a registration or login page, if you have registered then you can enter using the account that you have created to start the crossword puzzle game, but if not then you have to register in order to log in to the gameplay page. This page contains of:

- Account, which contains:
  - Username
  - Password
  - History
  - Email
  - ID
  - Activity

### Testing phase

1. Login user page  
This test is intended to test whether when entering an ID and password and also the e-mail used or even not being filled in and entering the login process, the system will display a message refusing to enter the system. So that not just anyone can enter the system and the system will direct the user to fill in the data again or it can be called registration in accordance with the terms and conditions of the user.
2. Registration page  
This testing phase is done to test whether when registering, whether the email entered has been used or not, self-data such as date and year of birth, name, and password. If you have not loaded the data, the system will read and give a warning to fill in the complete data.
3. User homepage  
This testing phase is done to test whether when we play if we enter the answer an error occurs or not, and when recording the score if it is not connected to the server whether the game will be stored automatically. If when entering the answer there is an error, an error will appear, "sorry there was an error" and it will be directed to previously stored

data, and if suddenly it is not connected to the server then the website has a history which saves every second of the user stored in the database

### Conclusion

1. Crossword puzzle is very useful for honing English language skills by answering each question and honing the logic of children aged 7 - 12 years they can improve their logic and understanding of English
2. With complete system design the system can make users comfortable with a variety of features provided such as, justification of answers, reminder alarms etc.
3. With the auto save system can save the last activity before logging out or when there is a disturbance

### Reference

- Sage, A. P. (1992). *Systems Engineering*. John Wiley & Sons, Inc.  
[https://books.google.co.id/books?id=ac9qKTXqAtQC&printsec=frontcover&hl=id&source=gbs\\_ge\\_summary\\_r&cad=0#v=onepage&q&f=false](https://books.google.co.id/books?id=ac9qKTXqAtQC&printsec=frontcover&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)
- Bell, D. (2003). UML basics : An introduction to the Unified Modeling Language A little background. *Rational Software*, 1–11.  
[http://www.therationaledge.com/content/jun\\_03/f\\_umlintro\\_db.jsp](http://www.therationaledge.com/content/jun_03/f_umlintro_db.jsp)
- Nickerson, R. S. (2011). *Five down, Absquatulated: Crossword puzzle clues to how the mind works*.  
<https://doi.org/10.3758/s13423-011-0069-x>