**2.0 Theoretical Framework**

**2.1 Introduction**

Before children are always playing outside. Children always playing different street games and most of the physical game. And that would be the childhood of the children before. The children ages 4-7 learn basic education through the help of the parents and using different books. But the current generation now was very different. Most of the time you can’t see children playing outside because children will play through tablet, mobile phone and laptop. Children are enjoying playing android games because of the attractive designs and features of android games.

The developers conducted a survey of what kind of android game that the children prefer and the result is the users want a game that can gain knowledge while playing android game.

**2.2 IT Theories**

**2.2.1 Game Engine**

Game engines are great things, able to take the weight off developing a game idea to let you focus on the idea itself. Powerful engines like the Unreal Engine, Source Engine and indie-darling Unity3D are examples of great tools built by people who want to make games bigger and better. Game engines provide developers with a slew of components and helpers they can use to build their games faster and with less hassle, but the most important factor games engine provide are interoperability between the various gaming systems available. [GIANT] Game engine help the developers because it suites provide facilities that ease development, such as graphics, sound, physics and all functions.

**2.2.1 Android Operating System**

The Android Operating System is a Linux-based OS developed by the Open Handset Alliance (OHA). Android OS shipments overtook those of Symbian in the 4th Quarter of 2010, dislodging the later from the number one spot among smartphone OSs. [TECH] The Android Operating System helps the developers to create a functional software,

* + 1. **Software Development Kit (SDK**)

A programming package that enables a  [programmer](http://www.webopedia.com/TERM/P/programmer.html)  to develop [applications](http://www.webopedia.com/TERM/A/application.html) for a specific [platform](http://www.webopedia.com/TERM/P/platform.html). Typically, an SDK includes one or more [APIs](http://www.webopedia.com/TERM/A/API.html), programming tools, and [documentation](http://www.webopedia.com/TERM/D/documentation.html). [WEB] SDK helps the developers to create a game because it is [software development](https://en.wikipedia.org/wiki/Software_development) tools that allows the creation of [applications](https://en.wikipedia.org/wiki/Application_software) for a certain [software](https://en.wikipedia.org/wiki/Software)

* + 1. **Graphical User Interface**

The **graphical user interface** (GUI) is the interface displayed on top of the player’s view of the world. It is primarily mouse-driven, but certain functions may be assigned keyboard shortcuts (some of which are bound by default). Similar to those found on personal computers. The advantages of the graphical user interface are far-reaching, and will become fully apparent as you get more familiar with Hog 4OS. [HIGH] GUI helps the developers when it comes in graphical deisgn of the game because GUI uses a combination of technologies and devices to provide a platform that user can interact with, for the tasks of gathering and producing information.

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**2.2.5 People**

The people who created the game.

**2.2.5.1 Animator**

The individual artists creating the animation. They are the person who decides how a model will move, what a scene looks like, and also what software and tools will be used for production. [WEB] The animator make a good interaction within the game also transitions in the game.

**2.2.5.2 Game Designer**

Game designers work with a team developing and designing video games. Game designers are an important part of a comprehensive team of designers and developers that coordinate the complex task of creating a new video game. Game designers have duties like designing characters, levels, puzzles, art and animation. They may also write code, using various computer programming languages. Depending on their career duties, they may also be responsible for project management tasks and testing early versions of video games. [STUD] Game designer focus on how to make the design more attractive to all the kids,

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**2.2.5.3 Game Programmer**

Game Programmers work at the heart of the game development process. They design and write the computer code that runs and controls the game, incorporating and adapting any ready-made code libraries and writing custom code as required. They test the code and fix bugs, and also develop customized tools for use by other members of the development team. Different platforms (games consoles, PCs, handhelds, mobiles, etc.) have particular programming requirements and there are also various specialisms within programming, such as physics programming, AI (artificial intelligence), 3D engine development, interface and control systems. [CREATE] Game programmer makes all the module of the game more functional and effective to all the users.

**2.2.5.4 Level Editor**

The Level Editor defines and creates interactive architecture for a segment of a game, including the landscape, buildings and objects. They must be true to the overall design specification, using the characters and story elements defined by the [Game Designer](http://creativeskillset.org/job_roles_and_stories/job_roles/331_games_designer), but they often have considerable freedom to vary the specific look and feel of the level for which they are responsible. They define the environment, general layout of the spaces within the level, and lighting, textures, and forms. The characters and objects involved, whether they are player-controlled or non-player characters and any specific behaviors associated with the characters and objects. [CREATE] Level editor make all the interaction in every level of the game, also responsible for all the layout inn each level of the game.

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**2.2.5.5 Players**

The one who played the game.

* + 1. **Unity Game Engine**

Unity is a powerful cross-platform engine and a user friendly development environment. Easy enough for the beginner and powerful enough for the expert; Unity should interest anybody who wants to easily create 3D games and applications for mobile, desktop, the web, and consoles**. [**CODE] Unity give more functional and reliable tools for the developers to create an awesome game.

* + 1. **Adobe Photoshop**

The software provides many image editing features for [raster](http://whatis.techtarget.com/definition/raster-graphics) ([pixel](http://whatis.techtarget.com/definition/pixel)-based) [images](http://whatis.techtarget.com/definition/image) as well as [vector graphics](http://searchwindevelopment.techtarget.com/definition/vector-graphics). It uses a layer-based editing system that enables image creation and altering with multiple overlays that support transparency. Layers can also act as masks or filters, altering underlying colors. Shadows and other effects can be added to the layers. Photoshop actions include automation features to reduce the need for repetitive tasks. An option known as Photoshop CC (Creative Cloud) allows users to work on content from any computer. [WHAT] Photoshop helps the game developers in creating a good graphic design of the character and all the objects needed in creating the game.

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**2.3 Non IT Theories**

**2.3.1 Brain Games**

A brain game is a genre of games that emphasizes the enhancement and memory of the brain. Brain games can test the attention, memory, calculation and the speed of thinking. [STACK] The developers choose to create a brain game because it is educational for the children and their minds will be stronger and sharper.

**2.3.2 Game Mechanics**

Game mechanics are constructs of [rules](https://en.wiktionary.org/wiki/rule) or methods designed for interaction with the [game](https://en.wikipedia.org/wiki/Game) state, thus providing [gameplay](https://en.wikipedia.org/wiki/Gameplay). All games use mechanics; however, theories and styles differ as to their ultimate importance to the game. In general, the process and study of [game design](https://en.wikipedia.org/wiki/Game_design), or [ludology](https://en.wikipedia.org/wiki/Ludology), are efforts to come up with game mechanics that allow for people playing a game to have an engaging, but not necessarily fun, experience. [WEB] The interaction of various game mechanics in a game determines the complexity and level of player interaction in the game, and in conjunction with the game's environment.

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**2.3.3 Difficulty Levels**

**2.3.3.1 Smart Phones**

Smartphones are a handheld [device](http://www.webopedia.com/TERM/D/device.html) that integrates mobile phone capabilities with the more common features of a handheld computer or [PDA](http://www.webopedia.com/TERM/P/PDA.html). Smartphones allow users to store information, [e-mail](http://www.webopedia.com/TERM/E/e_mail.html), and install programs, along with using a mobile phone in one device. For example, a Smartphone could be a mobile phone with some PDA functions integrated into the device, or vice versa. [SEARCH] The game can play through the help of smart phone because the game is a type of an android application.

**2.3.3.2 Games**

Games are distinct from [work](https://en.wikipedia.org/wiki/Manual_labour), which is usually carried out for [remuneration](https://en.wiktionary.org/wiki/remuneration), and from [art](https://en.wikipedia.org/wiki/Art), which is more often an expression of aesthetic or ideological elements. However, the distinction is not clear-cut, and many games are also considered to be work (such as [professional](https://en.wikipedia.org/wiki/Professional_sports) players of spectator sports or games) or art (such as [jigsaw puzzles](https://en.wikipedia.org/wiki/Jigsaw_puzzle) or games involving an artistic layout such as [Mahjong](https://en.wikipedia.org/wiki/Mahjong), [solitaire](https://en.wikipedia.org/wiki/Solitaire), or some [video games](https://en.wikipedia.org/wiki/Video_games)). [DICT]

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**2.4 Summary**

The developers propose a game that will teach the users basic education. A game that will enhance the user’s familiarity. The users will enjoy the game because of the attractive features and also the audio that will give trivia or facts. The developers use unity as the game engine because it is faster than android studio and more user-friendly to the developers. And the developers use the IT Theories as a help and references for making the game faster and more reliable. These researches help us developers to know the quality of the game we need to achieve in making the game.

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