

# COMPUTER GAME AS A TOOL FOR COGNITIVE ABILITY SENSITIZATION IN ADOLESCENTS

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**Abstract**— Computer games and console-based video games have generally been known for its entertaining nature due to its ability to provide some sort of motivation to the player of the game. Adolescents are also known to be pro-active in the way they perceive and use knowledge due to their very inquisitive nature. Computer games and console-based games as presented in this write up is seen to be a tool, useful enough to provide cognitive ability sensitization in adolescents as its known that many adolescents beginning in early to middle childhood and continuing through adulthood engage themselves in the act of playing computer and console-based video games. There have been so many positives about bringing the knowledge of computer games into the classroom to teach on a particular subject matter and by this, we mean bringing the knowledge of computer games to teach academic courses, health related issues and much more.

Computer games and console-based video games, though, have been tagged by some quarters to have some negative implication such as violence, depression and addiction while it is been played, but yet cannot be ruled out as a strong tool to help pass across strong learning messages as it tends to bring the players attentiveness and focus to a positive halt as they play the games in question, thereby helping to improve the level of cognition over time as the game is played over a period of time.

The developed computer game presented in this work, through careful and exhaustive analysis have proven without any benefit of a doubt that through its use, adolescents can improve their level of cognition i.e. the way they perceive and view information and apply it as knowledge, as it relates to a particular subject matter. This is because computer games have a great positive potential in addition to their entertainment value and there has been considerable success when games are designed to address a specific problem or teach specific subject areas to teach children on a certain skill development.

**Keywords**—*Computer games; Console-based games; Edutainment; Cognition; Adolescent.*

## I. INTRODUCTION

Computer games in recent times have become increasingly popular among people of diverse age, most especially the young ones. People of all ages play computer games as there is no longer a stereotype game player, but instead a game player could be your grandparent, your boss, or even your professor (Esa, 2014). This is due to the fact that computer games and console-based games have a way of carting a player to itself, as it provides some form of inspirational entertainment and motivation during the process of play. Computer games and console-based games have emerged as the most popular leisure-time activity for many students across different fields of study. This has led to the attraction of many researchers who wishes to use them as tools to improve the cognitive ability of adolescents in this generation.

Cognition deals with how an individual understands and acts in the real world. It defines a set of abilities, skills or processes that are part of human actions and could also be referred to as the psychological result of perception, learning and reasoning. Contrary to conventional beliefs that playing computer games and console-based games is intellectually lazy and sedating, it turns out that playing these games promotes a wide range of cognitive skills (Isabela et al., 2014). A recently published meta-analysis (Uttal et al., 2013) concluded that the spatial skills or spatial ability (a category of reasoning skills that refers to the capacity to think about objects in three dimensions and to draw conclusions about those objects) improvements derived from playing commercially available shooter computer games are comparable to the effects of formal (high school and university-level) courses aimed at enhancing these same skills. Further, this recent meta-analysis showed that spatial skills can be trained with video games in a

relatively brief period, that these training benefits last over an extended period of time, and crucially, that these skills transfer to other spatial tasks outside the video game context (Isabela et al., 2014).

## II. RELATED WORKS

Computer games are one of the many ways that the internet has changed how a generation of young people socialize and view entertainment (Annetta, 2008). The basic claim of this line of research is that computer games have beneficial impacts on individuals more than would have been taught in the classroom.

In the work of (Lieberman, 2001), The Management of Chronic Pediatric Diseases with Interactive Health Games was discussed based on Theory and Research Findings and one of the interactive health games that was discussed is an Asthma Self-Management interactive game called "Bronkie the Bronchiasaurus". To manage the character's in this interactive game, players must make sure the character takes daily medication; uses an inhaler and spacer correctly; avoids asthma triggers such as dust, smoke, pollen, furry animals, and cold viruses; monitors peak flow (breath strength) with a peak flow meter; responds to changes in peak flow; uses a sick day plan appropriately; reviews an asthma logbook that has the character's cumulative record of medications taken and highest and lowest peak flow levels each day; and learns about asthma management. After playing the game, a pretest-post test study was conducted at Stanford University Medical Center with 50 pediatric outpatients with asthma, ages 6 to 16. A researcher met with each child individually and administered a questionnaire before and after the child played Bronkie for 40 minutes. The child's parent filled out a paper-and-pencil questionnaire. One month later, the child and parent each responded to a delayed posttest telephone interview. Immediately after playing the video game and one month later, participants experienced significant improvements in asthma knowledge, self-efficacy for asthma self-management, and self-efficacy for talking with friends about asthma. During the month after they played the video game, there was an increase in the children's communication with their parents about asthma, compared to the month preceding the study.

In the work done by ANNE HARMAN in 2010, she designed GAME FOR THE WORLD, a conventional board game with the aim of promoting education and empowering dialog about the subject of HIV / AIDS in a safe and

engaging way. This game was designed basically for youths and adults to discuss their views, beliefs and attitude and feelings on HIV / AIDS and also contains facts about the subject matter and how to prevent the deadly disease from spreading. The particular problem identified here is that the game is just a conventional board game that is not computerized. The game was designed in collaboration with experts in the field of HIV / AIDS and can be played by those with the disease and those that don't have the disease. It provided an opportunity to those with the disease to play the game without having to reveal to those around if they have the ailment or not and also provided a means for those without the diseases to play the game and expand their knowledge about the particular subject matter.

Any game will not necessarily be suited to the teacher's objective. To choose the good one, it is necessary to classify games in a number of categories. Kirriemuir & McFarlane (2004) underline the absence of a standard categorization and chose, like Orwant (2000), the Herz system (1997), in eight categories. The categories include the following:

1. Action games
2. Adventure games
3. Fighting games
4. Puzzle games
5. Role-playing games
6. Simulations games
7. Sports games and
8. Strategy games

Other works on the educational potential of computer games are also categorizing computer games (Egenfeldt-Nielsen, 2005; McFarlane et al., 2002; Prensky, 2001, 2005). The classifications employed vary widely in the number of categories and in their ability to differentiate games. Nevertheless, an underlying idea is common to all categorizations: the potential of computer games varies qualitatively and quantitatively according to the type of games. A classification of computer games according to their educational potential is awaited by professionals.

## III. METHODOLOGY

The QUIZ CARD game takes the form of a board game in an electronic format that allows players of the game to take turns in playing. The idea of this game is to teach on the subject matter of HIV/AIDS as it was observed that most times, individuals of different age and culture tend to shy away from talking about the subject matter due to either fear

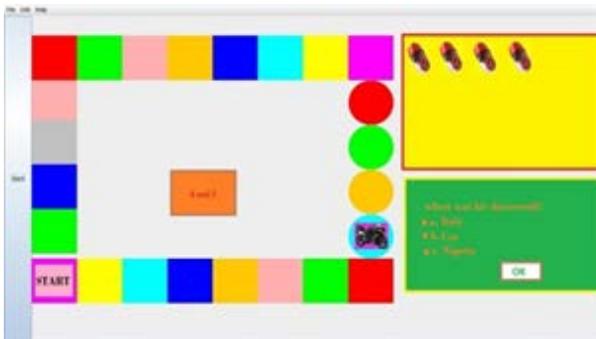
factor of others assuming they have the ailment.

The developed game is played by answering questions that gives you a better idea of HIV/AIDS and the more the game is played, it helps to sensitize the cognitive ability of the category of individuals in question. The game has a start point as shown in the general interface that was presented above, and also a goal state. Once a player gets to the goal state, a capsule is dropped in the box provided for it. The number of capsule dropped at the space provided signifies the number of times a player has gone through the goal state.

#### IV. RESULT

The general interface of the Quiz card Board game that was developed for the purpose of this research is displayed below:

A tabulated and concise collection of data that was gathered before the Quiz Card Board Game was played and after the Quiz Card Board Game was played for a while by different individuals of different ages. The table gives a record of the Pre-Evaluation i.e. an individuals knowledge of HIV/AIDS before the game is played and a Post-Evaluation i.e. an individuals knowledge of HIV/AIDS after the game has been played for a period of time.



**TABLE I. RESULT OF DATA COLLECTED BEFORE AND AFTER QUIZ CARD GAME PLAY BY DIFFERENT AGES.**

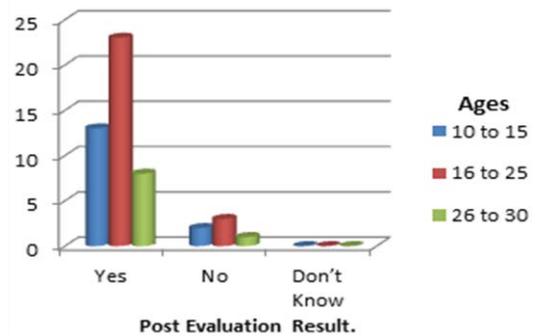
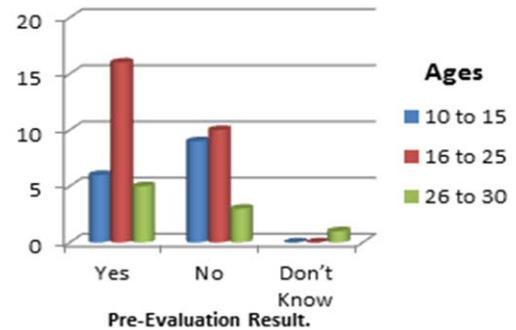
Age Group		Pre-Evaluation			Post-Evaluation		
	Frequ ency	Yes	No	Don't Know	Yes	No	Don't Know
10 to 15	15	6	9	0	13	2	0
16 to 25	26	16	10	0	23	3	0
26 to 30	9	5	3	1	8	1	0

A survey was carried out with the use of questionnaires which was administered before

and after the game was played to get the Pre-Evaluation and Post-Evaluation data presented in the table above.

Figure 3, below, shows the knowledge evaluation of different individuals of different age groups about the subject of HIV/AIDS before the game was played.

Figure 4 below, shows the knowledge evaluation of different individuals of different age groups about the subject of HIV/AIDS after the game was played.



#### INDIVIDUALS BEFORE GAME PLAY.

Comparing the pre and post analysis charts above, it is observed that the number of people that now has a better understanding of the subject matter improved greatly as result shows from both charts. It also submits that the application of computer games to a particular subject matter could and would improve the cognitive ability of players.

We also can deduce that the cognitive ability of a particular user or player of the game will drastically improve based on the mode at which the subject matter is presented; this includes the use of captivating images and some animations to boost the subject matter.

## V. CONCLUSION

This paper is as a result of studious research carried out on how to sensitize the cognitive ability in adolescents through the use of computer games or console-based games. At the end of this research on sensitization of cognitive abilities in adolescents, it was observed that the major challenge faced was not the fact that individuals would not have wanted to improve themselves cognitively about a particular subject matter, but that individuals of different ages across works of life most especially the adolescents, did not have the right platform to learn and improve their cognitive abilities as the case may be. It was also observed that adolescents would prefer what attracts them to learn in a more, entertaining and enjoyable manner. With the design of this particular game, there is every assuredness that, presented with the right tool to learn as seen from the analysis that was carried out before and after playing the Quize Card game, individuals of different ages most especially adolescents, can learn, benefit positively, and understand a particular subject matter after going through a process of play during few loops of the game play. It also presents the player of the game with an enjoyable form of learning as it brings the entertainment aspect of learning while the game is been played and also helps the player to be cognitively sensitized quicker than the formal high school method.

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