Chapter 23
Framework for Constructive Computer Game toward Empowering the Future Generation

S. C. Chiemeke
University of Benin, Nigeria

Y. O. Folajimi
University of Benin, Nigeria

ABSTRACT
The world of today has undergone a technological revolution that has drastically transformed society. The world is now accessible to every age group. One common application of modern computing among the younger generation is computer games. Although there are some advantages, many researchers have shown that they may be somewhat harmful to the growth and development of children. In this paper, the authors examine computer game use among youth, including the games they play and how constructive games can have positive development implications. One popular learning game is Scrabble (a trademark of the Hasbro Corporation). In this paper, the authors present the architecture of a constructive computer game, NigerScrab. NigerScrab is a version of the computer Scrabble game that is both entertaining and educational and has positive impacts on youth.

1. INTRODUCTION
The enormous strides that have been taken by the digital technology has added a lot of worry to the global society. As a matter of fact, parents and all concerned are beginning to argue that the world is becoming more insecure and stressful; especially with the irrational use to which IT applications are being subjected by users. The most vulnerable group of users to the negative consequences of these technological innovations have been identified to be the youth. Researchers have in fact argued signified that computer and video games contain anti-social features such as...
crime, violence, crude, pornography and obscene language. The most unfortunate part being the these are the kind of games that are generally attractive to youths and children. A survey of public computer and video game industry reveals that the games youngsters play most fall within the aforementioned categories. Research studies on the impact of computer generated crime games on character development for children exposed to them, indicate that there is a substantial connection between youth violence, computer violence, video games and films in general. Unlike TV and films where the child is usually just an observer, the sad thing with computer and video games is that the child is playing the game as an active participant either against another child, or against a computer program. There is no debate, therefore, on the fact that playing violent computer and video games encourages aggressive behaviour in children. The essence of this work is not to look at computer games from the negative consequences, but to encourage the use of computer game in a constructive manner, hence advocating the play of computer games with constructive ability.

Of thousands of serious computer games that have evolved over the years, Scrabble is one of those that have caught serious attention, being played by millions of players around the world (Alexander, 2010) Scrabble is a word game for 2, 3 or 4 players in which players take turn to form interlocking words by positioning lettered tiles drawn from a bag vertically or horizontally. A player has seven letters at each turn, with which he or she makes a word, or they skips a turn, and replace the seven letters. Each player competes for the highest score by using his or her letters in the most clever way and taking advantage of letter values and premium squares on the board.

When trying to come up with words in this game, people can either mentally rearrange the letters or physically rearrange the letters. Based on the idea that people routinely set up their environments to make their cognitive jobs easier, it is reasonable to suppose that it is easier to form words by physically moving the tiles than by simply imagining their rearrangement (Kirsh, 1995). (Fatsis, 2001) also argued that the generally acknowledged way of becoming an expert in Scrabble is to memorize long lists of unusual words that appear in the Official Scrabble Player’s Dictionary, concentrating on the ones that are most likely to be needed to get high scores from the letters on one’s rack. In doing this, players are able to effectively build their vocabulary. Our prototype game of scrabble presented in this work, Nigerscrab (Figure 1) is a Scrabble variation that implements most of its rules such as the ones stated below:

- The computer agent and human player plays turn by turn.
- Each player randomly picks tiles to make up 7 tiles in each turn
- First word must cover center tile.
- Words are read from left to right and top to bottom.
- If a player skips their turn they get 7 new letters.
- If a word does not exist, the player’s turn is skipped and letters are returned to the rack.
- The player with the highest cumulative score wins the game.

2. BACKGROUND

Prensky (2001) explained that games are a form of fun and play that provides enjoyment and pleasure to everybody. Games have goals, rules and win states that give users structure and motivation. They also are very interactive providing users positive and negative outcomes and feedback throughout play. Computer games provide straightforward navigation and increased motivation, which is easier for students to stay with the game in order to learn the concepts Scrabble game attracts users with clear stated goals and brief instructions. Scrabble is easy to get started and keeps users focused. As game plays continues,
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