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Motivational aspects of digital games

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ABSTRACT

With the advent of digital games and its rapid evolution, it is almost impossible for a lot of people especially the young children to go a day without coming into contact with them. One of the impacts of these digital games is that it is changing the way these young children think and learn. It is therefore important to carefully examine the influence of digital games on children's education. The purpose of this research is to identify and examine the factors that motivate children to play digital games and to determine the effect of such games to the children's learning abilities. Responses from 172 students of ages between 11 and 16 are analysed in this research. A questionnaire is used to capture the children's motivation towards digital gaming. Also, an intellectual test was carried out to determine the effect of digital games on the children's learning abilities. The findings have revealed that competitive spirit is the major factor that influences children to play digital games because of the challenge and the competition that comes along with it. Furthermore, a critical view from the results of the intellectual test has shown that the children that play digital games score higher results and were able to finish within a short period of time as against the children that do not play. The outcome of this research could be used to explore the possibilities of using digital games as tools for learning, especially to the young ages.

1. Introduction

The first computer games appeared in the middle of the twentieth century [1]. Since then, the development of these games proceeded at a rapid rate, which leads to the sweeping away of many old rules of learning [2]. It was increasingly realized that knowledge of fact was becoming less important than an understanding of situations. This is because learning by an actual observation was found to be a lot better than learning in a theoretical form from the traditional textbooks and the likes.

By the last decade of the twentieth century, the industry of computer games was reported to have generated more revenue than that of the film industry [3]. For example, when the digital game Call of

Duty (Modern Warfare 3) was released in November 2011, it broke previous sales records by making $400 million in the US and the UK within 24 hours – in contrast, the film Harry Potter and the Deathly Hallows (Part 2), broke global box office records in the same year by making $80m in one day. The popularity of computer games led to thinking about their effects on children's education [4]. This is because digital games became an important part of modern society as they were the ideal platform for presenting new content and new technology [5] because of the multitudes of people who play computer games and accept them as a normal form of entertainment [6].

[7] described digital games as a new mass medium with its characteristics as compared to the now traditional media such as books, television, film or music. They also pointed out that in contrast to all existing media, games have the ability to interact, and allowing the user to not just passively receive information but actively participate. Learning through digital games allows students to gain knowledge and acquire related skills through practical and more importantly "fun" experiences which they relate to much better [8], [9]. These games are transforming learning and opening up new ways for both learners and those who are helping them to learn. Learning with digital games enables learners to quickly grasp practical and technological concepts that can easily be applied to their own thinking [10], [11].

It is natural that some parents have a fear that their children spend hours on the computer or console playing games. It has been an object of worry that these children prefer to spend their time in front of the screen indoors than interacting outdoors [12]. In this research, we investigate the relationships between motivation, engagement and learning with respect to digital games and children's perception. The contributions of this research can be summarised as follows:

- Identification and examination of the factors that motivate children to play digital games.
- Investigation of the effect of digital games on children's learning abilities

The remaining section of this paper is organized as follows. We reviewed the literature in section 2. The materials and methods are presented in section 3. The results are discussed in section 4, and a brief conclusion is presented in section 5.

2. Literature Review

2.1. Digital Games as Learning Tools

Digital games play an important role in learning areas [13], [14]. They help people learn for many reasons. "Games are used to help people learn for three major reasons: motivation, content mastery, as well as higher order thinking and social skills." [15]. Content mastery can simply be described as the knowledge we gain through the facts and information generated by experts in a digital gaming context [16]. These types of games are very popular and they are mostly used in schools because they relate quite closely to the traditional learning practices in schools [17].

Higher order thinking and social skills are those skills that are used to solve problems, analyze data and give us the ability to collaborate with others [18]. In present times, these skills are very important as the world is becoming more digital. For us to move forward we need to develop higher order thinking skills and we also need to learn how to collaborate with people. "If indeed humans think immeasurably better as part of a network than on their own, then games are an obvious terrain in which to set minds free and let them wander around, interacting with whatever and whomever they encounter" [19]. This means if as a team, people do better than alone, then games are the best way to channel that interactive

power. They further explained, "The system of points badges, rewards and leader boards featured in most massively multiplayer online (MMO) games can be replicated in an educational context, experts say, to account for people's different motivations and needs for interaction or self-expression."

The games that trigger higher order thinking and social skills are often intellectually demanding. They are meant to present a challenge to the players so that they develop deep thinking and encourage social skills when multiple players come together to achieve a goal. If these types of games were to be incorporated in the curriculum of schools, it is believed that the possibilities of outstanding learning outcomes in the future would be infinite.

2.2. Digital Games as Motivational Tools

When something "motivates" you, it provides you with an incentive to do something or more simply put, it encourages you to do something [20]. So how do digital games motivate us to play? Going back to an early study of computer games, [21] identified three ways in which games provide intrinsically motivating experience: fantasy, challenge and curiosity. When we say action is intrinsically motivating, it means performing an action or behaviour because we enjoy the activity as opposed to extrinsic motivation which is done for the sake of some external outcome.

Fantasy is the way players can imagine themselves in contexts using realistic images provided by the game. Challenge can be defined as a difficult task which a person attempts and finds enjoyable because of that difficulty. Challenge depends on the degree of difficulty and level of uncertainty to drive players. [22] identified four factors which contribute to the challenge.

They are goals, uncertain outcome, self-esteem and toys vs tools. In order for the challenge to be an effective motivator, a balance must be made with the game being neither too difficult nor too hard. Lastly, curiosity can be defined as the way players continue to play a game in order to find out what will occur after certain actions are taken.

The factors above show that digital games are intrinsically motivating because of the presence of fantasy, challenge or curiosity. A study by [23] elaborates on endogenous (growing) fantasy and learning in digital games. They showed a link between fantasy and daydream and also defined a fantasy environment as, "one that evokes mental images of physical or social situations not actually present" attributing it with educational benefits based on the distinction between intrinsic and extrinsic (or endogenous and exogenous) fantasy.

3. Method

This study applied both quantitative and qualitative research method using studies and observations of the existing researches on digital games-based learning, Informal interviews with people who are familiar with digital games and the use of a closed response questionnaire together with an intellectual test session.

The sample in this study is based on stratified random sampling. This sampling technique is suitable for obtaining a sample from a large population [24]. The questionnaire and the intellectual test session were carried out in various schools in Nigeria. The sample consists of 172 students, in which 87 are boys and 85 are girls. Among them, 108 play digital games and 64 did not play any. The students were all between the ages of 11 and 16.

4. Results and Discussion

In this section, we discussed the research findings, which try to answer the question of why games are played and what motivates children to keep playing. Also, we present a discussion on how digital games affect children in learning areas.

4.1. Different Types of Computer Games Played by the Participants

63% of the participants played games and the remaining 37% did not play any game at all. Fig. 1 presents the different types of computer games played by the participants. Sports, Puzzle and Adventure games were the major games played by the participants. Other games include action games, quiz, trivia and etcetera.

As can easily be seen from Fig. 1, the participants played the category of sports games more than any other game, followed by puzzle and the adventure games. We have also observed that girls mostly play puzzle games, whereas boys mostly play adventure and sports games. Additionally, the participants played these games on different gaming platforms such as Play station, Nintendo Wii, laptops and even on mobile phones. Another important observation is that boys play more than girls and that boys spend more time playing digital games than girls.

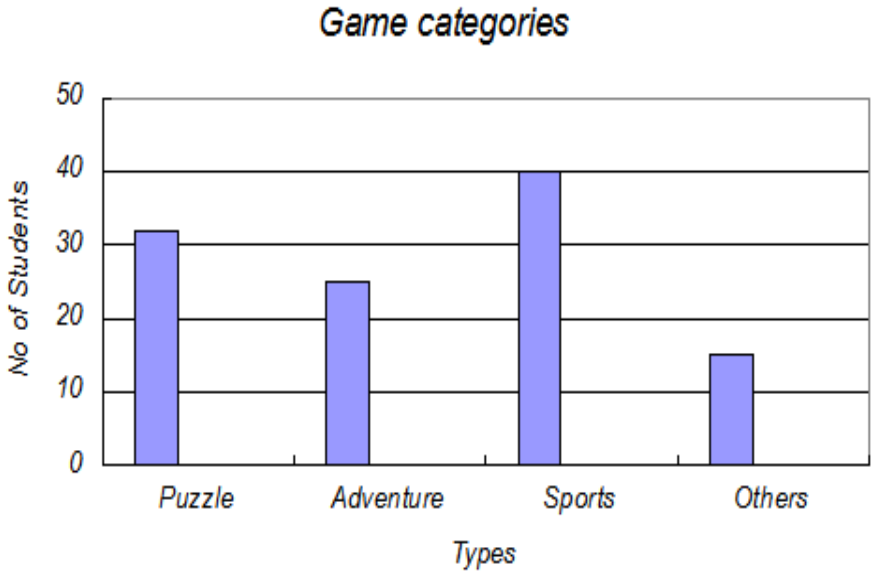

Fig. 1. Different types of computer games played by the participants

4.2. Time Spent Playing Digital Games by the Participants

Fig. 2 presents the distribution of the amount of time spent playing digital games by the participants. As can be seen from the figure, 40% of the participants play games at least once a week, 30% play games every day, 20% play games three times a week and the remaining 10% play games five times a week.

There was a particular student who decided to not choose an option and simply wrote, "I play whenever I feel like". We hypothesized that the effects of games will show more on those that play games every day or five times a week than those that play once or thrice a week.

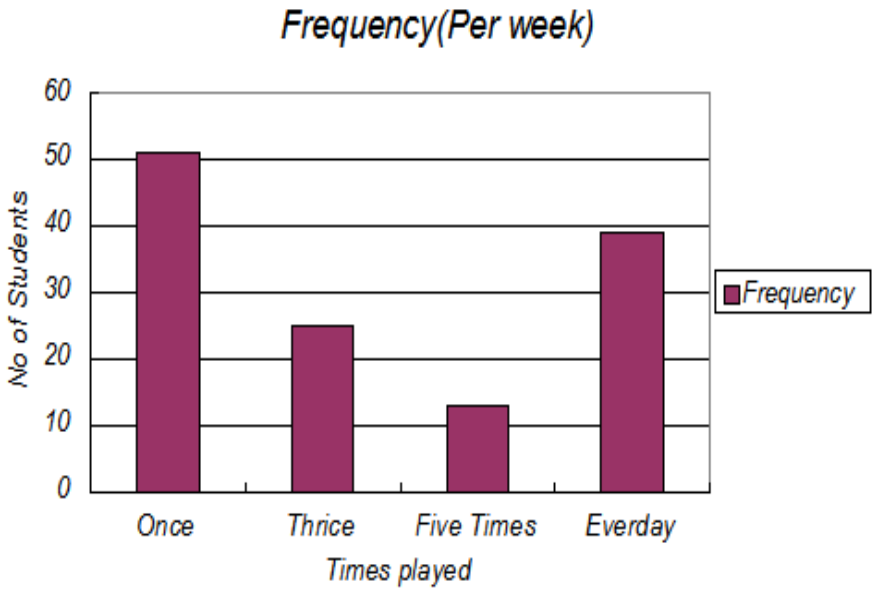

Fig. 2. Distribution of the amount of time spent playing games per week

4.3. Motivations on Why the Participants Play Digital Games

Fig. 3 presents the different reasons why the participants play digital games, and what motivates them to keep playing. Some played to relax or simply when they're bored, others played because of the challenges or entertainment they were presented with, some for a more understanding of the game. A good number of them played just because they liked competing with others. The various factors that motivate the participants to play digital games can be grouped into the following.

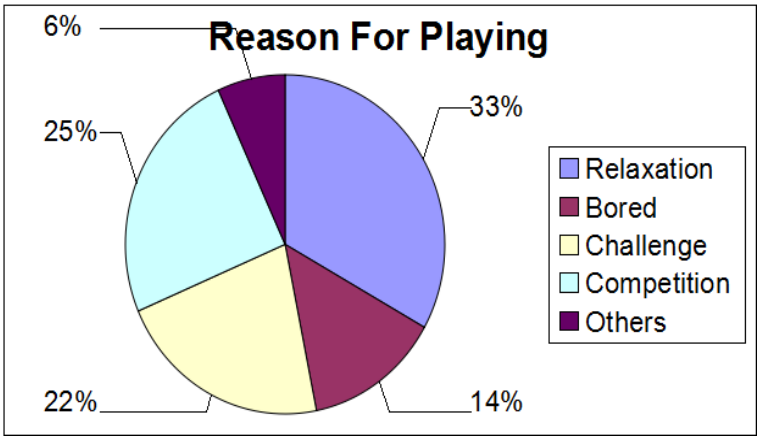

Fig. 3. Factors motivating the participants to play digital games

- **Competitive spirit**

  Malone (1987) [25] claims that an individual's desire is an optimal level of challenge. Almost 50% of those that play digital games played because of the challenge and the competition that comes along with it. Digital games bring out the competitive spirit in them and in doing so this makes them play for hours.

- **Interaction with friends**

Many of the participants would rather play with others than play alone. This is especially seen in those that play video games. As they interact with friends and siblings the games become much more fun to them and thus makes them continue playing.

- **Available time**

  A good percentage of the participants play when they're bored. Digital games are great past time for the players. When they have nothing to do they play these games for a good measure of time in order to keep themselves occupie.

- **Relieve Stress**

  The majority of the participants played digital games to relax. Relaxations put their minds at ease and make them relieve stress. Gaming becomes an outlet for stress and therefore becomes their "happy place" where they turn to after a chaotic, hectic or busy day.

- **Break a record**

  "Almost everything we know has to be practised: reading, speaking, calculating and even working in teams needs to be done over and over again in order to get it right" [19]. The participants often feel like they have to keep playing in order to break a certain record and as they are doing so they also become masters of the game. This is one of the key reasons that make players keep on playing.

4.4. Effects of Games in Learning Areas

All the participants that play digital games believed that they learn something from it in one way or the other. Some thought that they learn to keep trying because failure is part of the game, some thought that digital games taught them general knowledge and others thought that digital games motivates them to work with others and so on.

To determine the effect of digital games on children's learning abilities; we perform an intellectual test. Fig. 4 presents the performances of both the participants who played and the ones who did not play based on the intellectual test. It can be seen clearly that for those that play, the graph was progressive with an increase in the number of participants as the score increases while for those who didn't play the graph was somewhat regressive with a minimal number of participants with higher scores. This is nothing but an indication that the students with the overall better performances are those that play digital games.

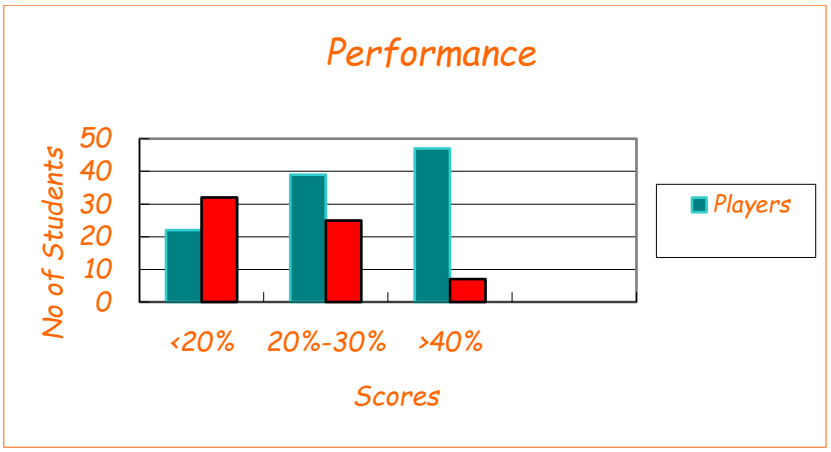

Fig. 4. Performance comparison of the intellectual test session

Also, we noticed the duration of time while attempting the questions. The participants who finished earlier signify that they were able to understand the questions and also attempt the questions a lot faster than the others. Their brains worked much faster while they were taking the test. As presented in Fig. 5, 42% of those that played were able to finish within 5 minutes as compared to the 20% of those who did not play. 6% of those who played finished within 20 minutes as compared to the 10% of those who didn't play. The difference is clearly seen and which indicate that playing digital games make children to reason and become smarter.

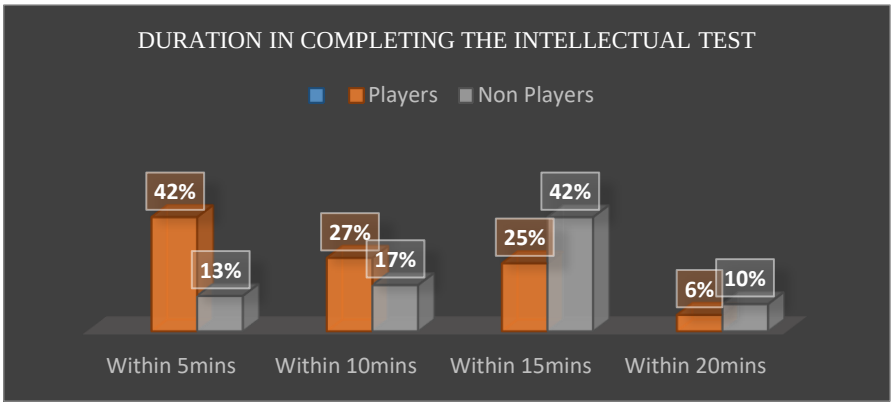

Fig. 5. Duration in Completing the Intellectual Test

We observed that the participants who played digital games especially those who spent more time playing were smarter in the way they answered the questions and also better in cognitive thinking as far as the test session was concerned which might help a lot in their learning areas as opposed to their counterparts who do not play digital games at all. Although this cannot mean in all aspects of their learning it does hint at the possibility of tapping all the positive aspects of digital gaming. It is clearly seen in this paper that the performance of the participants who played proved to be more positive. But of course, there are exceptions to every rule as it is in life as there were a few performances that defied the rule.

5. Conclusion

This research paper was based on the motivational aspects of digital gaming. Practical research was carried out on participants between the ages of 11 and 16 at various schools in Nigeria and a questionnaire was used together with an intellectual test session.

The questionnaire was used to identify the reasons why games are played and what motivates the participants to keep playing. Also, an intellectual test was made to gauge the effects of digital games in learning areas. It was found that digital games are very advantageous in learning areas as the results proved the positive effects it had on the participants. We, therefore, conclude that parents should not be afraid when their children spend so much time playing digital games. They should rather try and control the time keeping in mind that it can be a medium of learning. Learning through digital games has so much potential in store for their kids.

Also, schools should think of more ways to incorporate learning with educative games. Learning occurs naturally when students have fun while doing so. After all, we are in an information age where the world is fast becoming a global village.

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