The Influence of IT Artifacts on Players Leading to Internet Gaming Addiction among University Students in Africa

Completed Research

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Abstract

In recent times, there has been an emergence of behavioral addiction involving technologies. Since IT Artifacts in games designs are to influence the gamers to continue to play, this research is focused on the effect of IT Artifacts at the highest level of influence which is centered on human activities and behaviors. This study seeks to use Flow Theory to uncover varied internet gaming addictive behaviors among university students in Africa; using Ghana as a case study. Massively Multiplayer Online Role Playing Games (MMORPGs) are the games with the highest addictive tendencies (Jing and Hock 2012). This paper identifies various features of the game design (related to IT Artifacts) such as graphics, realistic sounds or audios, franchise or patent explicit contents and in-game advertising features and inherent elements of players that are likely to result in problematic playing which could cause flow and eventually lead to addiction.

Keywords

IT Artifacts, MMORPGs, Flow Theory, Internet Gaming Addiction

Introduction

This paper seeks to investigate the influence of IT Artifacts on Internet or Online Game players leading to technology addiction among university students in Africa. “Technology Addiction” (TA), is an emerging term in Information Systems (IS) research (Turel, Serenko, and Giles 2011). Therefore, there is no unique definition globally accepted for technology addiction. American Psychiatric Association (APA) operationally defined addiction as “the continued making maladaptive choices, even in the face of the explicitly stated desire to make a different choice” (APA 2013). (Griffiths 2008), however suggested another operational definition as “non-chemical (behavioral) addictions that evolve excessive human – machine interaction usually inducing and reinforcing features which may contribute to the promotion of addictive tendencies”. Although, the researchers agree with the two definitions, the research is done in line with (Griffiths 2010) conclusive view that “an activity cannot be described as an addiction if there are few (or no) negative consequences in the player’s life”.

There are several allied terms that could be used for technology addiction such as; pathological usage of video games, internet addiction or internet use disorder, compulsive use of the internet, and computer addiction (Turel, et. al. 2011). Gambling disorder is the closest behavioral addiction accepted by APA. (APA 2013). Also, Internet Gaming Disorder” (IGD) has been listed by APA as one of the behavioral disorders that require further research which is the foundation for this piece of work. IGD has been defined by APA as “persistent and recurrent use of the internet to engage in games, often with other players, leading to impairment or clinically significant distress” (APA 2013). MMORPGs were suggested to be the games with the highest addictive tendencies, e.g., Call of Duty or World of Warcraft (WoW)(Jing and Hock 2012). MMORPGs are unending such that the virtual world evolves even when the player is not online. These types of games attract millions or thousands of gamers around the globe who spend several hours on these games every day. These types of games have the ability of influencing users to be addicted which is
similar to substance addiction (Kuss, Louws, and Wiers 2012). The various definitions have explicitly shown that, addiction occurs only when one continues to play despite severe negative consequences. The research is done using Ghana as a case study. Ghana is located along the Gulf of Guinea and Atlantic Ocean in the subregion of West Africa which is one of the five sub regions of Africa. Africa is the second largest and second most populated continent in the world (Sayre and Pulley 1999). This research is focused on young people who are studying in various universities and it’s worth noting that Africa has an average population which is the youngest among all the continents in the world (Harry 2013).

The main purpose of this research work is to find out how a player can become addicted to the games, investigate the IT Artifacts used in designing the game which have the tendency of causing one to get into flow and how that flow leads to addiction. It will further examine the negative effects of playing online games (MMORPGS). The researchers will finally develop a process model for internet gaming addiction.

The paper is structured as follows: the first section is introduction; the second section is literature review which covers conceptualization of internet gaming addiction, MMORPGs, IT artifacts and flow theory; the third section focuses on research methodology which includes research design, data collection tools and procedure, validity and reliability and data processing; the fourth section is findings and case study results; then data analysis and discussions; the final section is conclusion and implications for future research.

Conceptualizing Internet Gaming Addiction

The term Internet Gaming Addiction (IGA) and Internet Gaming Disorder (IGP) are used interchangeably in this piece of work. While IGD has been defined earlier according to APA, IGA has also been defined as “users inability to control or regulate online game play which results in functional impairment in terms of maintaining a regular life cycle, as well as academic, occupational, and social functioning” (Young 1996).

Online gaming is gathering momentum and popularity over time and has drawn the interest of academics (Seok and DaCosta 2012). Gaming is an “entertainment-oriented information technology” (IT). According to the studies conducted by Hsu and Lu, the reason or purpose of playing online games varies from “traditional task-oriented IT” (Hsu and Lu 2004). Online gaming addiction has several commonalities and reactions similar to substance addiction, most methods used for treating substance addictions could also be used for treating behavioral addictions (Du, Jiang and Vance 2010; Young 2007).

Massively Multiplayer Online Role Playing Games (MMORPGs)

“Massively Multiplayer Online Game” (MMOG) is combined with “Role Playing Video Game” (RPG) to originate or produce “Massively Multiplayer Online Role – Playing Game” (MMORPG). The term MMORPG was first used by Richard Garriott to denote “massive multiplayer online role-playing games” and their social communities (Jan 2010). MMORPGs are online games that allow two different very large groups who may even be hundreds of thousands of players to play opposing roles in a virtual world. In terms of the number of online subscriptions “World of Warcraft” (WoW), a “Massively Multiplayer Online Role-Playing Game” (MMORPG), was adjudged the number one or first (Activision Blizzard 2010).

The high engagement or usage of MMOGs in many countries is beginning to emerge as a social challenge in these recent times. The rate of extreme or excessive online game engagement across nations is between 8 to 11.9 percent (Gentile 2009). In recent times, the number of deaths reported as a result of playing MMOG is increasing rapidly (Lee 2013; Sun 2011). With the increasing growth rate, researchers from different sectors are now being influenced to research in the high engagement or problematic use of the game (MMOG). In some countries, parents are now using the court systems to prevent their children from uncontrollably playing the online games (Ng 2012). Also in some countries, regulations and laws are being enacted to prevent high engagement and uncontrollable use of the online games (Hawkins 2012).

Conceptualizing IT Artifacts in Information Systems (IS) Research

IS discipline is essentially tied to IT Artifacts; IS research is basically done around people (individuals), technologies and organizations (Orlikowski and Iacono 2001). Conceptualization and positioning IT
Artifacts in IS Research has been a long standing debate in IS discipline and was extensively written about from 2001 to 2005 (Agarwal, Henry and Lucas 2005; Benbasat and Zmud 2003; Orlikowski and Iacono 2001; Saunders and Wu 2003). The IT Artifacts selected by researchers for this piece of work were the presentation features of the game.

**Information Technology (IT) Artifact Definitions**

The IT Artifacts are viewed from three critical perspectives in this research. These are; the design or technical, the humans or social perspectives and the socio technical perspectives. In relation to design or technical, (Orlikowski and Iacono 2001) defined IT Artifacts as “bundles of material and cultural properties packaged in some socially recognizable form such as hardware and / or software”. Hevner and his friends also defined it as “constructs (vocabulary and symbols), models (abstractions and representations), methods (algorithms and practices), and instantiations (implemented and prototype systems)” (Hevner et al. 2004). These definitions were reinforced by (Agarwal and Lucas 2005) when they defined IT Artifacts as “the integration of the processing logic found in computers with the massive stores of databases and the connectivity of communication networks”, so that it “includes IT infrastructure, innovations with technology, and especially the Internet”. However, (King and Lyytinen 2004) defined IT Artifacts as “systematic processing of information in human enterprise”. This skewed the definition towards social or humans’ application of IT Artifacts.

In terms of socio – technical which provides the bridge between social and technology that is between the designers or developers and application by users; (Benbasat and Zmud 2003) defined IT Artifacts as “the application of IT to enable or support some task(s) embedded within a structure(s) that itself is embedded within a context(s), ‘whereby its hardware / software design’ encapsulates the structure, routines, norms, and values implicit in the rich contexts within which the artifacts are embedded”. (Zhang, Scialdone, and Ku 2011) who also corroborated the above definition several years later and stated that “An IT artifact is an entity/object, or a bundle thereof, intentionally engineered to benefit certain people with certain purposes and goals in certain contexts. It is developed, introduced, adopted, and operated, modified, adapted, discarded, and researched within contexts and with various perspectives”. The researchers therefore adopted socio – technical perspective definitions for this piece of work.

**Flow Theory**

Flow is “optimal experience” and known as “the zone”, which was propounded by Mihaly Csikzentmihalyi. He defined flow as “the holistic experience that people feel when they act with total involvement” (Csikzentmihalyi, 1975. p. 36). He explained it as “the mental state of operation by which one is deeply engrossed in an activity such that there is a complete absorption causing loss of time and sense of reasoning”. (Csikzentmihalyi 1991), further clarified that “the state in which people are so involved in an activity that nothing seems to matter; the experience itself is so enjoyable that people will do it at great cost, for the sheer sake of doing it”. Flow is when demand equals ability as shown in the fig 1. below:

![Figure 1. Flow in relation to Internet or Online Game Play](adapted from Csikzentmihalyi (1992)).

When an individual is in flow, his or her concentration becomes so intense that little or no attention is paid to nothing else; time is distorted and self-consciousness vanishes. “An activity that produces such
Internet Gaming Addiction among University Students in Africa

experiences is so gratifying that people are willing to do it for its own sake, with little concern for what they will get out of it, even when it is difficult or dangerous” (Csikzentmihalyi 1991 p.71). Although, the above descriptions of flow situations are very relevant to the researchers, (Griffiths 2010) made it clear that “an activity cannot be described as an addiction if there are few (or no) negative consequences in the player’s life” According to (King, Defabbro and Griffiths 2010), the features in the game that are able to cause one to get into flow are; social features, manipulating and control features, narrative and identity features, reward features, punishment features and presentation features. 

The presentation features and their examples are listed in the table below:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Sub features</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation Features</td>
<td>Graphics and sounds features</td>
<td>Realistic sounds, fast music</td>
</tr>
<tr>
<td></td>
<td>Franchise features</td>
<td>Trade – marked names, e.g. Mario</td>
</tr>
<tr>
<td></td>
<td>Explicit content features</td>
<td>(Violence, drug use, nudity)</td>
</tr>
<tr>
<td></td>
<td>In-game advertising features</td>
<td>Real – life brands, sponsors, logos</td>
</tr>
</tbody>
</table>

Adapted from (King, Defabbro and Griffiths 2010)

Research Methodology

As Critical Realists focus is to “get beneath the surface to understand and explain why things are as they are, to hypothesize the structures and mechanisms that shape observable events” (Mingers 2004. p.100). To understand how gamers become addicted to the game, the research is conducted using qualitative study (Chollet et al. 2013) through semi – structured interview (Wacheux 1996) and personal observations (Kawulich 2005). Nine (9) participants were engaged during this research over a period of five (5) months. Six (6) of the participants were players of MMORPGs, three (3) others were non – players of the game but closely related to the players of the game had observed them over a varied periods of time that is (1) Parent, one (1) Lecturer and one (1) Clinical Psychologist (Addiction Center Manager) with 25 years of experience. The following issues were covered; (a) the gamers were interviewed and observed on IT Artifacts features of the MMORPGs that are able to get them into flow situations (b) how the gamer gets into flow and eventually how that flow results or leads one to become addicted to the game (c) the consequences of games on real life of gamers (players) were also examined. The players were selected from three different universities in Ghana. Two from University of Ghana (A Public University), two from Ghana Technology University (A Private University) and two persons from Ho Technical University ( A Public Technical University).

The results of the qualitative interview were validated using analytical triangulation (Padgett DK 1998). The questions adopted for this work were dependent on Game Addiction Scale (Lemmens, Valkenburg and Peter 2009), Flow Short Scale (Rheinberg et. al 2002), Internet Addiction Test (Young 1998), and Components Model (Griffiths 2005)

The method adopted was to help go beneath the surface to know the mechanisms and structured of the games in terms of IT Artifacts that have the capacity of influencing the players which may lead to addiction empirical realities associated with IT Artifacts that have the propensity of leading users to addiction (Creswell 2003).

Research Design

The case study method which is a rigorous method suitable for investigating social and behavioral problems was used for this piece of work. It was noted for “an in – depth examination, detailed definition
Internet Gaming Addiction among University Students in Africa

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and interpretation of one or more cases” (McMillan and Schumacher 2006). Yin (1984 p.23) defined it as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context; when the boundaries between phenomenon and context are not clearly evident; and in which multiple sources of evidence are used.” For case studies, the results are generalized based on theory and not on population (Yin 1994).

Therefore, in designing this paper, a Clinical Psychologist who is also a Certified Addiction Expert in charge of Addiction Center at Korle Bu Teaching Hospital in Ghana was contacted after he was interviewed on Joy News TV, a television channel on MultiTV in Ghana. This Expert introduced the researchers to (2) students who were reported to the center as addicted to the game and other substances. Through referrals by these two (2) gamers, four (4) of their colleagues who were excessive gamers or players accepted and participated in this research. One parent, a mother of one of the players was also interviewed to discover and corroborate the findings. Finally, a lecturer who was close to two of the students was also interviewed to authenticate some of the results especially those related to academics and social life of students on campus since the research was focused on university students.

Data Collection Tools and Procedure

Semi structured questionnaire was used for the survey picking questions from Game Addiction Scale (Lemmens, Valkenburg and Peter 2009), Internet Addiction Test by (Young 1998), Components Model by (Griffiths 2005), Diagnostics Internet Addiction Criteria (Tao et al. 2010) and Flow Short Scale (Rheinberg et. al 2002). The questionnaire was finalized after it was perused a by an Expert in charge of Addiction Center at Korle Bu Teaching Hospital in Ghana and piloted on some selected students. It was then used to conduct face to face in-depth interviews on all respondents. The gamers were further observed playing the games on different days and times during the five (5) months period. These interview sessions were recorded and later transcribed into written documents. These documents were validated by the respondents.

Validity and Reliability

These measures were taken to ensure validity and reliability of this research: (i) a conceptual framework was developed which guided the interview sessions; the answers from respondents were transcribed directly into a written form without making any changes. These were validated by the participants (ii) the initial descriptive analysis were derived from the semi – structured questionnaires (iii) the descriptive analysis was used to generate the internal validity of the themes and sub themes which were then authenticated using heterogeneity criteria. (iv) the raw data collected from the field and the corresponding analysis were saved for the future. The gamers were also observed playing the games over the period at different times which helped to authenticate their responses to the questions.

The data collected from these few participants are valid and reliable since according to the Clinical Psychology interviewed for this work, one addict represents thousands of addicts and data collected from one addict may be generalised to apply to several addicts this is due to the fact that symptoms associated with the addicts are the same, the reactions and physiological syndromes are also virtually the same. This was supported by literature which states that “generalization of results from case studies, either from single or multiple designs should stem on theory rather than on populations” (Yin 1994)

Data Processing

The descriptive analysis was used to analyse the qualitative data. After coding, the themes and sub – themes immergeed which guided the discussion of the findings. Nine (9) participants were interviewed and recorded; the audio recordings were transcribed verbatim thus the transcript of the interviews were legibly and clearly written down into written documents and given back to the interviewees to crosscheck for accuracy. After the approval from the persons interviewed, the write-ups were subdivided into umbrella codes and sub codes using a code tree. No software was used for the data analysis.

The research purpose and objectives that directed the course of this piece of work was used in generating the codes. Then the theory was also used to revise into context the codes by providing labels and defining
the data to reflect or be a true representation of the actual raw data. In addition, the recommendation by (DeCuir-Gunby, Marshall, and McCulloch 2011), the next level of coding was done using data – driven method; this method enables codes to be written at the paragraph and sentence levels. The individual interviewee records were investigated independently using the framework provided to enhance validity and reliability of the data using analytical triangulation (Padgett DK 1998). The patterns identified from the interviews were categorised to show convergence and saturation. The methods deployed to improve rigor was by using different methods to collect the data.

Findings and Case Study Results

Flow is achieved anytime the player’s abilities which are his/her internal elements (social) interact with IT Artifacts (technical) which are the demands of the game as shown in the model. The participants were engaged to find out if they played the MMORPGs either by the influence of their internal states and or the features that the game which is restricted to the presentation features because they are well recognised as IT Artifacts in Information Systems research and practice. The sub themes from internal state were; pleasure, self-esteem, self-efficacy and emotivity (Chollet, Bourdon and Rodhain 2015) while presentation feature sub themes were; graphics, realistic music and sounds, franchise or trademarks, explicit content and in-game advertising (King, Defabbro and Griffiths 2010). All the six students agreed that they were influenced to play the games as a result of some of the above features. Example; one student said “Anytime I feel bored or lonely, then I activate my game mood”; while another said: “I always want be on the game anytime I am happy or excited”; yet another attributed it to artifacts and internal states “If the game contains real images, sounds or music, then I have the edge and ability to play it endlessly”. All the six (6) players agreed that they started playing and eventually developed addictive tendencies over time. These assertions were validated by the parent who further estimated the period that it took the son to be addicted as nine (9) months which agreed with literature that “addictive tendencies develop gradually and problems related to internet or game use arise when players give up most of their leisure activities to pursue online pleasures” (Chou 2001; Tsai and Lin 2003).

The presentation feature of the MMORPGs that all the six (6) students associated themselves with sturdily as causing them to be committed to the game is explicit content feature, which is sub themed as violence, nudity, and drug use features, etc. A participant stated: “MMORPGs allow me to destroy and kill anybody or animal that may want to attack me. I am normally over excited or better still I feel so very good when I finished destroying and my points are given to me to be more powerful. I want to rule in the game as a King".

Graphics and sounds were rated as second most addictive IT artifact of the game. A player reported that: “When the graphics and sound quality of a particular MMORPG is real, the game becomes so electrifying and I am unable to quit easily”.

This was followed by franchise i.e. trademarks features and then in-game advertising came last in the rating. The researchers further observed the players during playing sessions and authenticated the data.

The participants used the time spent daily and longest continuous session in playing the games to describe their current patterns and how they have moved to abuse and dependency. The daily time spent ranges from 4 hours to 24 hours. Example, a student stated that: “The game world is now part of me, I enjoy that world and more happy online playing game than anything else so I ever played the game 24 hours in a day before”. These playing time durations were authenticated by the parent who explained that, her son could lock himself for a whole day or two in his room and played the games, she observed that, it was frequent before and immediately after he was released from the Addiction Center but during the five (5) months period of this research it only happened three (3) times. The Clinical Psychologist also authenticated the duration by clarifying addicts are capable of doing anything, he continued that, sometimes when those are addicted to substances are undergoing rehabilitation, they try to find alternative sources of activities to engage themselves in and these could be other online games, which engage them for a longer period than expected and eventually lead to cross addiction and influences them to return back to their substance addiction, he therefore suggested that rehabilitation of such people should be holistic.
The last theme was developed around the consequences of MMORPGs on players’ lives. The sub themes developed from these were; the social, psychological, physical health, mental, and academic productivity. For example in considering social, the researchers tried to find out how the games are influencing the gamers real life in terms of relationship with their colleague students, lecturers, friends and families. There were very interesting revelations, four of those who were interviewed do not have social lives and therefore do not have friends they are committed to in real life but have so many friends in the virtual world. One of them retorted “I already have millions of friends when playing the MMORPGs, why should I border myself with someone in real life who may not make me happy after all; I prefer to have allegiance with my friends online”. This was supported by the Lecturer who stated that one of his students especially the one who reported to the Addiction Center was mostly lonely on campus. The Clinical Psychologist explained that immediately the gamer unconsciously starts reacting either physiologically or psychologically when the game is not available, then know that the person is addicted and would suffer severe consequences. This is supported by (Griffiths 2010) who concludes that “an activity cannot be described as an addiction if there are few (or no) negative consequences in the player’s life”.

Psychologically, the players sometimes get depressed, sad, developed anxiety or are excited during and after the game, so the game has a way of witching their mood, when they are defeated in the game, then the negative tendencies are the likely consequences and when they win the result of their mood is always in the positive. A player remarked “I always want to win and be a hero, anytime I am defeated, I feel so sad sometimes I even cry”.

On health, two of the participants complained of health complications anytime they played the games over three and five hours respectively. Mentally, three students complained about mental abnormalities e.g. depression when they over played the games, although only two of them actually reported this at the Center. Three of the students were unable to clearly state how the games affect them mentally.

The final sub theme considered in this research was academic productivity. Five (5) players agreed to the fact that the games affected them negatively as far as academic work was concerned, one of them remarked “if I were to be using the time I normally use in playing MMORPGs on studying my books, I should be in first class and be the best student in my class”. When the researchers then suggested to him to quit the game and concentrate on his studies, he responded: “life is not only about academic, I feel satisfied and gratified playing this game and I don’t think of quitting soon”. One (1) of those referral participants agreed to almost every question to show that he was an excessive player but did not agree that he had negative consequences, he rather informed the researchers that was in Second Class Upper and needed some few points to enter First Class and that he was confident of completing with first class. He was the only player who suggested that he used the MMORPGs and other internet or online games to build his social class, release stress, learn leadership qualities, have fore knowledge about technological innovations. He further stated most adventure films are developed based on the internet or online games. Relating this to (Griffiths 2010), the above student was not addicted although he was an excessive player, even two (2) of the participants held him high in playing the online games. It was worth noting that, he played the games mostly during his leisure periods, weekends and holidays. This is in line with what Professor Reeves of Stanford University; “If you want to see what the corporate leadership might look like in three to five years, look at what’s happening in online games”. The Lecturer interviewed also authenticated the answers of his two students, while one was very good academically; the other one had several referrals and could be dismissed if he does not change.
Data Analysis and Discussions

To understand the findings of this research work, a model was proposed by the researchers. This model was developed by adopting internal state of game players (i.e. pleasure, self-esteem, self-efficacy, and emotivity) from a research model developed by (Chollet, Bourdon and Rodhain 2015). The presentation features on the taxonomy table adapted from (King, Defabbro and Griffiths 2010) were used as artifacts and the component of flow theory proposed by (Csikszentmihalyi 1975). While the internal state of the player represents the struggle within an individual who plays the online games, the IT Artifacts are various features used in a game design which have the propensity of attracting and triggering an individual to play the games. Flow is achieved anytime the demand in terms of features of the game is equal to the abilities (internal state of the player) to play the game. Flow has control, attention, curiosity and intrinsic elements as its internal components. When there is a negative consequence of the game, then, the player is said to be addicted, otherwise then the player is not as shown below:

Fig. 2. The Proposed Process Model for Internet Gaming Addiction

Conclusions and Implications for Future Research

This research clearly shows how one is triggered to play internet or online games e.g. MMORPGs, the process which leads the player to become addicted to the games. While five online game players who participated in this piece of work were addicted to games, one (1) was not. This sets the tone for an in-depth future research in the positive effects of internet or online games. Another social media platforms e.g. facebook, instagram etc may be tested on the model developed by the researcher. In terms of theory, a different theory such as gratification theory could also be used to determine how a player becomes addicted to the games. The developers who want to capture the African market must improve on explicit content, graphic and sound features in order to make good sales. Players of the game must be cautious when in flow so that it does not lead to addiction. Relations of players must be vigilant and take actions if a player begins increasing his playing duration and showing some dependency symptoms.
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Internet Gaming Addiction among University Students in Africa


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Twenty-fourth Americas Conference on Information Systems, New Orleans, 2018