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# An Exploratory Study of the Risks snd Motivating Factors of ICT Abuse among Students of Tertiary Institutions in Nigeria

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## ABSTRACT

This research explores the risk and motivating factors of ICT abuse among students in tertiary institutions within the context of a developing country. This study is a preliminary investigation undertaken to explore the prevalence of a relatively new phenomenon among college students in the south-western part of Nigeria; Internet use that interferes with social or academic functioning. The study shows that small group of students, primarily student who do not notice that use of internet could lead to abuse, use the Internet to the degree that it has a negative impact on their academic or social lives.

**Keywords**: ICT, internet, risk, students, tertiary institutions

## 1. INTRODUCTION

Information and communication technologies (particularly Computers and the Internet) are widely acknowledged as important resources for socio-economic advancement in both developed and developing countries. Information Communication Technology (ICT) is the processing, maintenance and integration of information, and the use of all forms of computer, communication, network and mobile technologies to mediate information. Communication technologies include all media employed in transmitting audio, video, data or multimedia such as cable, satellite, fibre optics, wireless (radio, infra-red, bluetooth, Wifi). Network technologies include personal area networks (PAN), campus area network (CAN), intranets, extranets, LANs, WANs, MANs and the internet [19].

Complete Internet access at the tertiary institutions provides students the opportunity to take care of their academic needs such as download of relevant materials for their course of study, payment of bills, checking for the latest news on the institution websites and possibly communicating with friends and family around the world. As a result, students' misuse of the Internet for other use such gaming, pornography, entertainment and the like has been labelled as Internet abuse. It is a kind of internet use that interferes with social or academic functioning. Internet usage and access in the World has been proliferating year by year, with approximately 1.11 billion users in 2007, 1.67 billion in 2009, and 1.97 billion in 2010 [16], indicating an upward trend in the number of digitally literate people. The rapid growth has been interacted with people's needs and motivation. Information, communication, and entertainment have been the prominent motives behind the use of powerful tool called Internet.

The World Wide Web (WWW) became available in Nigeria in 1996, while full Internet services became available in 1998, and number of NCC (Nigerian Communications Commission) licensed Internet service Providers rose to over 150 by 2001. With an estimated total population of over 140 million people, Nigeria is the most populated black nation in the world, with Internet hosts as low as 1,094. In late 2003, Nigeria had a total of 750,000 Internet users and 60 users per 10,000 inhabitants representing 0.5 percent of the population. Nigeria had a total of 853,000 PC's and 0.71 pc's per 100 inhabitants as at 2003. The history of the Internet has long been linked to university education. This is because the adoption of the Internet in Tertiary system has intensified access to information and communication by providing un-reserved access to e-mail messages, web boards, online services, e-publication and so on.

The internet has leveraged itself as a mainstream Information and Communication Technology (ICT) tool in the academic environment. The internet has transformed how academic activities are being carried out by providing teachers and students a ubiquitous one step access to e-textbooks, publications, online distance learning, real time admission process automation and communication facilitation. However, there is always a positive and negative side of every phenomenon, the concept of Internet abuse has not been empirically researched in Nigeria. Therefore, the purpose of this exploratory study was to investigate if motivating factors of Internet use could lead students to become abuser and to identify the risks involved by this misuse. This will encourage college administrators and student affairs personnel, particularly those involved with mental health issues, to be aware of the types of problems that can arise from excessive use of the Internet.

## 2. RESEARCH QUESTIONS AND HYPOTHESES

This study aims to address the following research questions and the hypotheses.

RQ1: What is the overall profile of tertiary institutions students with respect to internet and computer use?

RQ2: Does usage of internet differ in terms of gender and age?

> *H2A: Male student are more likely to be susceptible to Internet abuse than Female student.*
> *H2B: Young students are more prone to internet abuse than old students.*

RQ3: What are the motivating factors for the misuse of internet?

> *H3A: Free and unlimited Internet access is a significant predictor of Internet abuse among Nigerian tertiary institution students.*

RQ4: Having the motivating factors in place, what are the risks pose to the internet abusers?

> *H4A: Students who abuse the internet will present a poorer academic performance than standard Internet users.*
> *H4B: student who are standard internet users develop good relationship than student that abuse it.*
> *H4C: internet abuse student suffers health risk than non-abuse student.*

## 3. BACKGROUND STUDY

Internet abuse is the most studied negative impact on information and communication technological. According to [22], internet abuse may better be conceptualized as an impulse-control disorder but the question still remains, is Internet abuse a distinct disorder? The evidence thus far indicates that a small percent of people develop problems from their use of the Internet. This does not, however, necessarily support that Internet abuse is a distinct disorder. The association between disturbed use of the Internet and other pathologies such as depression, loneliness, and social anxiety suggests that Internet abuse may be symptomatic of other disorders for some.

Rather than focus on a unified concept of Internet abuse, it may be more helpful to conceptualize and study disturbed patterns separately according to specific Internet activities [17]. Indeed, the misuse of internet services can involve different forms of related dependence behaviours, such as an abuse of social networks (such as facebook, twitter etc), cybersex, online gambling (e.g. casino), [1], Internet abuse has been linked with some psychological variables, such as anxiety [2], shyness, social withdrawal [25] attention deficit/ hyperactivity disorder [4], dissociation [6], and insecure attachment styles [15].

The advantages of the Internet are undeniable despite the rapid flow of information and potential educational value of the Internet; there are several attributes of the Internet which may foster abuse among students in tertiary institutions in Nigeria. These attributes include easy and flexible access 24 hours a day; anonymity; provision of free, diversified, and unlimited number of social networks without geographical boundaries; greater control over one's self-presentation; and provision of numerous opportunities to fulfil the need for belongingness as well as to escape from emotional difficulties, problematic situations, and personal hardships. Technological abuse has its root in the assumption that new technologies contain inducing and reinforcing features which may contribute to the promotion of abusive tendencies. Indeed, research has demonstrated that some people are more likely to be involved in a problematic use of information and communication technologies, such as internet [27] or mobile phones [21].

Internet abuse among Tertiary institution students has been recorded through academic research in the USA [9], Taiwan [15], Norway [12], England [11], Italy [8]; Internet abuse has also been studied in Nigeria [7]. [24] gave an extensive review and conducted a study on gender differences in Internet use patterns and Internet application preferences in a sample of 1190 surveys. He concluded that there were several gender differences in preferences for specific Internet applications. Results had shown that male student use the Internet mainly for purposes related to entertainment and leisure, whereas female student use it primarily for interpersonal communication and educational assistance. However, additional analyses showed that several gender differences were mediated by differences in age and Internet experience. His results were in accordance with many previous results which had shown mainly that female students were less familiar with the use of the Internet [10], suggesting at some period that male comprised 95 % of Internet users and female just 5%. Explanations for this gender gap have been given and rely on gender differences in self-efficacy and attitudes toward computers. Male students are generally considered more experienced in programming and computer games than females and report having had more encouragement from parents and friends previously, in contrast to female who might have been discouraged from using modern technologies.

The same gender gap between male and female has been noticed with Internet Abuse. [18] reported that male students were more likely than female students to be pathological users (12% vs. 3%), whereas female students were more likely than male students to have no symptoms (28% vs. 26%) or have limited symptoms (69% vs. 61%) of behavioural pathology. [20] reported that dependent Internet users included a significantly larger proportion of male to female (71% male and 29% female, respectively) than non-dependent users (50% male and female). Thus, these studies, and several more, demonstrate that at least male tertiary institution students are more prone to Internet Abuse.

The reasons for male predominance in Internet Abuse have been proposed to be overuse of pornography sites, dating sites online gambling and online gaming abuse. [22] give a satisfactory explanation supporting the view that pornographic sites leads to more frequent Internet Abuse: A study on gender differences in sexual arousal found that male tends to be more visual with respect to sexual fantasies while females are more process or verbally oriented. As the cost of bandwidths decreased drastically in recent years, the Internet has become more abundant with graphical information.

[18] measured pathological Internet use, including a new question on the extent to which academic obligations suffered due to the result of Internet usage; they found that 27.3% of students with pathological Internet use had missed classes because of online activities. [13] evaluated Internet dependency in a sample of 542 university students and found that 9% of the participants classified themselves as being psychologically dependent on the Internet, and also identified themselves as having trouble with schoolwork, missing class time, and having a sense of guilt and lack of control over their Internet use. Internet dependent students seem to be more likely to damage their academic careers due to excessive usage.

The results support greater use of the Internet by dependent users and increased probability for them to skip class [20]. [3] conducted an online survey on 49,609 students from 156 universities in Asia. They defined heavy Internet users as those who used the Internet over 33.9 hours per week and those under this threshold as non-heavy users. Differences in academic grades and learning satisfaction between heavy and non-heavy Internet users were statistically significant. Non-heavy users had better grades and greater learning satisfaction than heavy users. The data suggested that student who spends a significant amount of time online, experience academic and learning difficulties.

The two risks factors of Internet Abuse that cause poor academic attendance, are the maladaptive cognitions related to Internet addiction (shyness, depression, low self-esteem) [5], as well as the physical element of time loss. Internet addicted users spend excessive amounts of time in front of their systems. Moreover, these abnormal patterns of use cause lack of sleep because the student stays awake during late night hours in order to browse different web pages. This lack of sleep causes a lack of concentration and loss of interest in everyday lectures leading to reduced reading of course material and, consequently, poor marks during the exam period [14]. [5] suggests that free and unlimited access is a necessary contributory cause for the subject to develop pathological Internet use, which is similar to internet abuse.

Research has shown that access to Internet differ among each student. Some students prefer to access the Internet from home, while others prefer to go outside of their home to places such as the school library or an Internet café. Additionally, it has been proven that the location for accessing the Internet has many times been associated with the development of Internet abuse [26]. Places where Internet access is unlimited or free, where there is no guardian or parental supervision increase there is high possibility for a subject to remain on the Internet. As mentioned above, tertiary institution students are most prone to this, because in their hostel or in the campus, free and unlimited access to the Internet is available with no parental supervision, enabling them to use it without restriction.

## 4. RESEARCH METHODOLOGY

This exploratory study was conducted in tertiary institutions in the south western part of Nigeria. Survey questionnaires were designed and administered directly to a total of 206 students who are in Colleges of Education, polytechnics and Universities. The questionnaires were administered specifically to students who were currently on campus. A total of 206 questionnaires were administered to the students. Out of the 206 students who received the questionnaires, only 200 students (97.7per cent) returned the completed and valid questionnaires. The questionnaire was designed specifically to explore the abuse of the internet, including the risk and the motivating factors. The questionnaire consisted of 3 sections of questions, section A deals with the demographic information of the respondents, section B consists of the motivating factors that leads to internet abuse and lastly section C involves the risk factors that students would experience from abusing the internet. Owing to the relatively small sample size and the exploratory nature of this study, we advise that the results presented in this paper should be treated cautiously as preliminary. We require a larger sample to arrive at more comprehensive conclusions.

## 5. DATA ANALYSIS AND RESULTS

The questionnaires were initially coded in order to quantify the items. Next, all the data were entered to Statistical Package for the Social Sciences (SPSS 17). Then, they were subjected to frequency and percentage analyses in order to check for possible errors made during the data entrance. This also helped to describe the variables. Finally, a series of one–way between–groups analysis of variance (ANOVA) to determine which hypothesis will be accepted or rejected.

### 5.1 The relationship between internet usage patterns and Internet abuse

Similar ANOVA tests were repeated to determine whether Internet abuse significantly differed across the levels of Internet usage patterns. Table 1 summarizes the results of ANOVA analyses.

Table1: The Result of Anova Analysis

| | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Academic | Between Groups | 1.811 | 3 | .604 | .567 | .637 |
| | Within Groups | 205.409 | 193 | 1.064 | | |
| | Total | 207.219 | 196 | | | |
| Health | Between Groups | 2.566 | 3 | .855 | 1.254 | .292 |
| | Within Groups | 129.635 | 190 | .682 | | |
| | Total | 132.201 | 193 | | | |
| AGE | Between Groups | 1.530 | 3 | .510 | 2.316 | .077 |
| | Within Groups | 43.375 | 197 | .220 | | |
| | Total | 44.905 | 200 | | | |
| GENDER | Between Groups | 2.394 | 3 | .798 | 3.285 | .022 |
| | Within Groups | 48.587 | 200 | .243 | | |
| | Total | 50.980 | 203 | | | |
| Monetary Cost | Between Groups | 20.733 | 3 | 6.911 | 8.446 | .000 |
| | Within Groups | 159.568 | 195 | .818 | | |
| | Total | 180.302 | 198 | | | |

Table 1 shows one–way between–groups ANOVA results for the test of hypothesis to be rejected or accepted. From the result in the table: we will accept our hypothesis if the level of significance is above 0.05 and reject if it is below. It indicated that our first hypothesis is false (Male student are not likely to be susceptible to Internet abuse than Female student) the value of the level of significance from our statistical table is 0.022. The result shows that our first hypothesis to be false. From the table of the ANOVA, there is a value of 0.637 for level of significance which will allow us to accept the second hypothesis that 'Students who abuse the internet will present a poorer academic performance than students who don't'. Accepting this hypothesis also validates the outcomes of other researches conducted to support this hypothesis. There was no significant difference to associate that "Free and unlimited Internet access as a significant predictor of Internet abuse among Nigerian tertiary institution students" It demonstrates from the result of the analysis in the table above, that free and unlimited access will not increase the tendency of the students to become internet dependent.

The fourth hypothesis will be accepted because with a level of significance value of 0.077 which is greater than our level of significance of 0.05 indicates the acceptance of this hypothesis from the analysis of variance. The result reveals to us that 'young students will have a higher tendency to become internet abuser than older students in the higher institution'. Based on the result obtained from the ANOVA table, there is a clear indication that 'Students who abuses the Internet will suffer health risk than students who do not abuse the Internet' then we will accept this hypothesis having a higher value of 0.292 which is far above our level of significance of 0.05.

**5.2 Correlations between the Risk and Motivating factors**
The table 2 is used to determine if there is any correlation between the motivating factors (Physical motivating factors and Emotional motivating factors) and the risk that could occur in academics, psychological, health, social and moral. The correlations between the Motivating factors and the Risks factors is displayed in a tabular form in table 3, only factors with level of significance higher than 0.05 will indicate there is a correlation between the factors: for easy understanding and to know which of this factors are correlated to each other.

**Table 2: Correlation between Motivating Factors and Risk Factor**

| | | Physical motivating factors | Emotional motivating factors | Academic | Psychological | Social | Health | Moral |
|---|---|---|---|---|---|---|---|---|
| Physical Motivating factors | PearsonCorrelation | 1 | -.052 | .090 | -.084 | -.107 | .029 | -.149* |
| | Sig. (2-tailed) | | .494 | .226 | .269 | .155 | .698 | .046 |
| | N | 184 | 178 | 181 | 174 | 177 | 179 | 180 |
| Emotional Motivating factors | Pearson Correlation | -.052 | 1 | .016 | .253** | .264** | .049 | .142 |
| | Sig. (2-tailed) | .494 | | .822 | .000 | .000 | .507 | .050 |
| | N | 178 | 195 | 194 | 187 | 187 | 188 | 190 |
| Academic | Pearson Correlation | .090 | .016 | 1 | .275** | .241** | .179* | .162* |
| | Sig. (2-tailed) | .226 | .822 | | .000 | .001 | .013 | .024 |
| | N | 181 | 194 | 198 | 189 | 190 | 191 | 193 |
| Psychological | Pearson Correlation | -.084 | .253** | .275** | 1 | .615** | .292** | .307** |
| | Sig. (2-tailed) | .269 | .000 | .000 | | .000 | .000 | .000 |
| | N | 174 | 187 | 189 | 192 | 186 | 185 | 187 |
| Social | Pearson Correlation | -.107 | .264** | .241** | .615** | 1 | .354** | .326** |
| | Sig. (2-tailed) | .155 | .000 | .001 | .000 | | .000 | .000 |
| | N | 177 | 187 | 190 | 186 | 193 | 186 | 188 |
| Health | Pearson Correlation | .029 | .049 | .179* | .292** | .354** | 1 | .215** |
| | Sig. (2-tailed) | .698 | .507 | .013 | .000 | .000 | | .003 |
| | N | 179 | 188 | 191 | 185 | 186 | 194 | 191 |
| Moral | Pearson Correlation | -.149* | .142 | .162* | .307** | .326** | .215** | 1 |
| | Sig. (2-tailed) | .046 | .050 | .024 | .000 | .000 | .003 | |
| | N | 180 | 190 | 193 | 187 | 188 | 191 | 196 |

**Table 3: Summary of Correlations between the Risk and the Motivating Factors**

| No Correlation | Correlation Exist |
|---|---|
| Physical and Emotional motivating factors | Physical motivating factor and Academic risk |
| Physical motivating factor and Psychological risks | Emotional motivating factors and Academic risks |
| Physical motivating factor and Social risks | Emotional motivating factors and Psychological risks |
| Physical motivating factor and Health risks | Emotional motivating factors and Social risks |
| Physical motivating factor and Moral risks | Emotional motivating factors and Health risks |
|  | Emotional motivating factors and Moral risks |

**5.3 Descriptive Analysis of Internet Usage Pattern**

Table 4 presents Internet usage patterns and their categories with respective percentages. In terms of the frequency of use, about (6.4%) used the Internet in the morning, about ten percent (9.3%) used it in the afternoon, more than a quarter used it in the evening (35.8%), with above a quarter also used it also in the night (36.3%), less than ten percent (6.9%) and about five percent (5.4%) used it overnight. More than a quarter of the users (37.4%) reported "home", thirty-three percent (33.0%) reported "cybercafés," and about one quarter of the proportion (26.1%) reported "school" as their dominant place of Internet use.

Moreover, a tiny proportion (3.5%) specified other places that included workplace, library, and others. When asked about the purpose for which they mostly use the Internet, 20.89%, 17.98%, 16.66%, 13.49%, 8.20%, 6.34% indicated Chatting, Social networking, Browse or surf the Internet, Looking for news, Email and Listen or download music respectively. The remaining, of about 16.38 percent, reported using the Internet for these purposes (Blog, Watch movies or TV online, Play computer games online, Internet shopping or selling and hacking).

**Table 4: Descriptive Analysis**

| Pattern / category | Frequency (f) | Percentage (%) |
|---|---|---|
| Period of Internet use |  |  |
| Morning | 13 | 6.4 |
| Afternoon | 19 | 9.3 |
| Evening | 73 | 35.8 |
| Night | 74 | 36.3 |
| Late night / early morning | 14 | 6.9 |
| Over – night | 11 | 5.4 |
| Total | 206 | 100.0 |
| Dominant place of Internet use |  |  |
| Cyber café | 67 | 33.0 |
| School | 53 | 26.1 |
| Home | 76 | 37.4 |
| Work | 4 | 2.0 |
| Library | 1 | 0.5 |
| Others | 2 | 1.0 |
| Total | 203 | 100.0 |
| Dominant purpose of internet use |  |  |
| Email |  |  |
| Chatting | 31 | 8.20 |
| Browse or surf the Internet | 79 | 20.89 |
| Blog | 63 | 16.66 |
| Use Social network sites | 14 | 3.70 |
| Watch movies or TV online | 68 | 17.98 |
| Play computer games online | 12 | 3.17 |
| Listen to or download music | 18 | 4.76 |
| Looking for news | 24 | 6.34 |
| Internet shopping or selling | 51 | 13.49 |
| Hacking | 8 | 2.11 |
| Total | 10 | 2.64 |
|  | 378 | 100 |

### 5.4 Impact of Excessive Internet use on Academic, Social or General Lifestyle

We used five Likert-type scale to explore how Internet use might result in academic, social, or lifestyle problems in answer to the second research question. Previous research has shown that college students often underestimate the effect of their Internet use. We anticipated, therefore, that respondents might be reluctant or unable to give an accurate portrayal of how their Internet use affected various aspects of their lives. Thus, it may be more informative to compare relative differences; that is, the difference between those who use the Internet for longer periods of time compared with those who use the Internet infrequently.

If students have underreported Internet use, it seems probable that the differences between high and low user would be more likely to provide some information about the nature of this effect. For this analysis, we divided the Internet users into high-use and low-use groups. We defined high use as spending more than 300 minutes per day on the internet. Roughly 12% of the responding internet users indicated that they spent more than 300 minutes per day online. To assess the effects of Internet use in five areas (academic achievement, psychological, social, health, and moral), we used linear regression. Surprisingly, only one area is affected and that is psychological. There is no distinguished difference between high-use and low-use group. The respondent did indicate that they felt much negative effect in all areas because of their Internet use, the high –use group did report more negative consequences than the low use group did.

**Table 5: Results of Effects of internet Use on academic achievement, psychological, social, health, and moral**

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| 1    (Constant) | 3.278 | .439 | | 7.462 | .000 |
| Academic | .025 | .067 | .029 | .370 | .712 |
| psychological | -.295 | .127 | -.220 | -2.321 | .021 |
| Social | .053 | .116 | .045 | .452 | .652 |
| Health | -.021 | .091 | -.019 | -.234 | .815 |
| Moral | -.109 | .094 | -.092 | -1.154 | .250 |

a.    Dependent Variable: amount of time you stay online

**Coefficients[a]**

## 6. DISCUSSION

While those who use the internet excessively are difficult to identify (self-report of the problem appears to be rare), it is important to note that this problem occurs primarily among men and particularly in the hard science majors. However, as the use of Internet in both academic and non-academic venues continues to expand, it seems likely that the problem will continue to grow. It has been suggested that problems related to excessive Internet use stem from two primary sources: easy availability and a developmental vulnerability of the population. It seems obvious that methods for dealing with this problem should address the central causes; however, it is likely that developing effective developmental interventions may prove difficult.

Many students prefer to deal with problems as they occur instead of opting for preventive developmental interventions. One possible solution may be the use of programmatic interventions that focus on the developmental difficulties that influence excessive Internet usage. These programs may be most useful at institutions that have a high percentage of students in the hard science majors. Another suggested solution would be to monitor and or restrict Internet use. While this solution might seem counter-productive to computer systems administrators, increasing their awareness of the problem might provide some motivation for encouraging them to develop strategies that may help resolve this problem.

For example, instead of monitoring the direction or purpose of an individual's Internet use, it may be more effective to develop a countdown timer that tracks the amount of time spent on-line. If each Internet account was structured so that it functioned as a debit system, those who use the Internet for excessive amounts of time would be using their allotted time more quickly and then perhaps flagged for further evaluation or inspection. While some system administrators might view this as an infringement of a student's right to system access, this may be preferable to letting the dependent student go unnoticed.

It is clear that this problem has, until now, received relatively little research attention. As more research on the topic is done, it is hoped that more effective solutions and suggestions will be realized.

## 7. CONCLUSION

Very little data has been collected with regard to patterns of Internet use among college students. It is hoped that this preliminary study will encourage college administrators and student affairs professionals, particularly those involved with mental health issues, to become more aware of the types of problems that can arise from excessive use of the Internet. However, one limitation of this study must be considered. Given that this survey was administered around campuses, it may be that other students that are abusing the internet were not around campus at the time to take the survey. Therefore, it is possible that this survey is an underrepresentation of the extreme users - those students who are so consumed that they rarely leave their room or move around easily.

Since Internet use is often encouraged, or even promoted as a valued feature of academic institutions, it seems reasonable to assume that finding methods to deal with this problem will require multiple levels of intervention.

## REFERENCES

[1] Cantelini T. and Talli M. (2009) Trapped in the web: the psychopathology; first experimental data, clinical aspects and critical notes. Italian journal of Psychopathology 6, 40-51.

[2] Chak, K., & Leung, L. (2004). Shyness and locus of control as predictors of Internet addiction and Internet use. *CyberPsychology & Behavior, 7*, 559-570.

[3] Chen, Y.F., Peng, S.S., (2008), 'University students' internet use and its relationships with academic performance, interpersonal relationships, psychosocial adjustment, and self-evaluation', *CyberPsychology & Behaviour*, 11, pp. 467-469.

[4] Cho SC, Kim JW, Kin BN, Lee JH, Kim EH (2008). Biogenetic Temperament and character profiles and attention deficit hyperactivity disorder symptoms in Korean adolescents with problematic internet use. CyberPsychology & Behaviour 11, 735-737.

[5] Davis, R.A., (2001), 'A cognitive-behavioural model of pathological internet use', *Computers in Human Behaviour*, 17, pp. 187-195.

[6] De Bernadis D, D'Albenzio A., Gambi F. et.al.(2009) Alevithymia and its relationship with dissociative Experiences and internet addiction in a nonclinical sample. Cyber Psychology & Behaviour 12, 67-69.

[7] Ezema M.E and Inyama H.C. (2012) An assessment of Internet Abuse in Nigeria. Computer Science Department, University Nigeria Nsukka.

[8] Ferraro, G., Caci, B., D'amico, A., & Blasi, M. D. (2007). Internet addiction disorder: An Italian study. *CyberPsychology & Behavior, 10*(2), 170–175. Frangos, C. C., Frangos, C. C., & Kiohos, A. P. (2010). Internet addiction among Greek university students: Demographic associations with the phenomenon, using the Greek version of Young's internet addiction test. *International Journal of Economic Sciences and Applied Research, 3*(1), 49–74.

[9] Fitzpatrick, J.J., (2008), 'Internet addiction: recognition and interventions', *Archives of Psychiatric Nursing*, 22, pp. 59-60.

[10] Georgia Tech GVU WWW survey, (1994), *Graphics, visualization, and Usability Center (GVU). Results from the first world wide web user survey,* Atlanta, Georgia Tech Research Corporation. Available at: http://www.cc.gatech.edu/gvu/user_surveys/survey -01-1994. Accessed: 24 March 2013.

[11] Griffiths, M., Miller, H., Gillespie, T., Sparrow, P., (1999), 'Internet usage and 'Internet addiction' in students and its implications for student learning', *Journal of Computer Assisted Learning*, 15, pp. 85-90.

[12] Johansson, A., & Gotestam, G. (2004). Internet addiction: Characteristics of a questionnaire and prevalence in Norwegian youth (12–18 years). *Scandinavian Journal of Psychology, 45*(3), 223–224.

[13] Kubey, R.W., Lavin, M.J., Barrows, J.R., (2001), 'Internet use and collegiate academic performance decrements: Early findings', *Journal of Communication*, 51, pp. 366-382.

[14] Lavin M, Marvin K, McLarney A, Nola V, Scott L. (1999). Sensation seeking and collegiate vulnerability to internet dependence. Cyberpsychol Behav. 1999;2(5):425–430.

[15] Lin MP, Ko HC, Wu JY (2011) Prevalence and Psychosocial risk factor associated with internet addiction in a nationally representative sample of college students in Taiwan. Cyber Psychology & Behaviour 14, 741-746.

[16] Miniwatts Marketing Group. (2010). *Internet world stats: Usage and population statistics.* Retrieved from the Internet World Stats website: http://www.internetworldstats.com/stats.htm.

[17] Morahan-Martin J. (2005) Internet Abuse Addiction? Disorder? Symptom? Alternative Explanations? Social Science Computer Review, Vol. 23 No. 1, spring 2005 39-48 DOI: 10.1177/0894439304271533 Sage Publications.

[18] Morahan-Martin, J., Schumacher, P., (2000), 'Incidence and correlates of pathological Internet use among college students', *Computers in Human Behavior*, 16, 13-29.

[19] Iloanusi Ogechukwu N. & Charles C. Osuagwu (2006) ICT Diffusion and Uptake in Nigerian Tertiary educational Institutions: Trends, Perspectives and Possibilities. African Journal of Computer and ICTs (IEEE). Special Issue on ICTs in the African Environment Vol. 5. No. 4 Issue 2, ISSN- 2006-1781 pp. 77-84.

[20] Scherer, K., (1997), 'College Life On-Line: Healthy and Unhealthy Internet Use', *Journal of College Student Development*, 38, pp. 655-665.

[21] Takao M, Takahashi S. Kitamura M.(2009). Addictive personality and problematic phone use. CyberPsychology & Behaviour 12, 501-507.

[22] Treuer, T., Fabian, Z., & Furedi, J. (2001). Internet addiction associated with features of impulse control disorder: Is it a real psychiatric disorder? *Journal of Affective Disorders*, *66*, 283.

[23] Tsai, H.F., Cheng, S.H., Yeh, T.L., Shih, C.C., Chen, K.C., Yang, Y.C., Yang, Y.K., (2009),'The risk factors of Internet addiction-A survey of university freshmen', *Psychiatry Research*, 167, pp. 294-299.

[24] Weiser, E.B., (2000), 'Gender Differences in Internet Use Patterns and Internet Application Preferences: A Two-Sample Comparison', *CyberPsychology & Behavior*, 3, pp. 167-178.

[25] Whang LS, Lee S., Chang Q (2003) internet overusers psychological profiles: A behavior sampling analysis on internet addiction. CyberPsychology & Behaviour 6, 143-150.

[26] Young, K.S., (2004), 'Internet Addiction: A New Clinical Phenomenon and Its Consequences', *American Behavioral Scientist*, 48, pp. 402-415.

[27] Young, K. S., Yue, X. D., & Ying, L. (2011). Prevalence estimates and etiologic models of Internet addiction. In K. S. Young & C. N. de Abreu (Eds.), *Internet addiction: A handbook and guide to evaluation and treatment* (pp. 3–18). Hoboken, NJ: John Wiley & Sons.

**Authors' Biographies**



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