

Adolescents and Internet Addiction: A research study of the occurrence

ARGYRIS V. KARAPETSAS*, APOSTOLOS J. FOTIS**, NICK C. ZYGOURIS***

Summary

The technological development of Internet was designed to promote research and communication among technological institutions as well as military services. However, its immense propagation, mainly within specific population groups like young people, contributed to internet addiction of young people, which constitutes a research field for scientific society. The current protocol aims at studying the multitude and characteristics of addicted to internet students. The research was conducted over 100 adolescents with mean age 14,5(S.D. 0,647) that studied at high schools of Volos. The rates of students' internet addiction are higher in Magnesia than anywhere in Thessaly, a fact that determined our choice for the area of the research. The extent of the problem of students' internet addiction is highlighted. In what follows we used the Internet Addiction Diagnostic Questionnaire by Young (1996)[1] to locate cases of internet addiction. Research findings indicate that a 22% of students as were diagnosed internet addicted. This high rate is extremely alarming. Concern is thus raised upon the impact such an addiction may have on society and its youngest members in particular. The data now presented are to be used in a pilot study now conducted in the Neuropsychology Laboratory of the University of Thessaly.

Key words: Addiction, Internet, Young people

Introduction

A virtually new tool, Internet has become a part of many peoples', mostly young [2,38], everyday routine.

*Professor of Neuropsychology – Neurolinguistics ,
University of Thessaly .

**Phd. candidate of Clinical Neuropsychology, University of
Thessaly

***Doctor of Clinical Neuropsychology, University of
Thessaly

It is of extreme importance to be able to draw information and communicate as an active member of the international internet community. This is now well understood by many people

The term internet was first introduced in 1982, while became more widespread in the mid 90's. The numerous communication and information possibilities it provided, became widely acknowledged really soon. While initial browsers were not easy to use, this is not the case anymore thanks to new developments in the technologies of Human-Computer Interaction (HCI) which led to handy and functional browsers. Internet was spread and still spreads dramatically.

Despite the fact that our study focuses on the negative effects of internet use, its advantages should not be ignored. Socialization and exchange of ideas are the main advantages of internet use for students [3,4]. Social relationships can be reformulated overcoming physical distance constraints that impede communication, while one can also develop new social contacts. Educational benefits for students are also of importance. School laboratory simulation websites offer students the chance to communicate within the frame of a virtual study, research and analysis of ideas space. Through the internet, students get also in touch to new, multiple ideas and distant cultures, enhancing their familiarization to new technologies too. Moreover, many students may have their self-esteem increased by assisting in computer applications use within their own classroom, being themselves experts due to excessive use of both the internet and the computer. Like every other tool, the internet has unfortunately and negative aspects. The vast majority of online data are of questionable reliability. It is thus quite possible for students not having formed yet a stable character, to be encountered to information not only unreliable but often hazardous for their psyche. Pornographic material for example, being easily accessible to students through internet, causes problems as far as their personal,

social and school life is concerned. What is more, problematic use of the internet can be associated with problems among family members [3,5] as the possibility of substantial communication is lost, most time being consumed online. This reverse of family relationships has been presented quite precisely by many researches [2,6,7]. Children online activities deprive them of substantial in-family communication, making lying an everyday practice⁶. User anonymity is another characteristic of online activities. Many students tend to appear under pseudo-personality, an imaginary perfect character. Thus they risk getting in touch with sexually and mentally disturbed people or getting involved in illegal gangs without even being aware of it.

Ivan Goldberg was the first who made reference to the notion of internet addiction in 1995 [8]. However, the term "internet addiction" was established a year later by psychologist Kimberly Young. Numerous references to negative consequences of internet use followed [9,10,11,12,13,14,15,16,36,39,40].

While many researchers hold the view that the term addiction can only be appropriate in cases of drug use [17,18], their view has not prevailed. The term addicted was thus used to refer to people in pathological relationship to gambling [19], gaming [20], food (hyperphagia [21], physical activity [22], sexual relationships [23] and television programmes [24].

Young (1996) presented a brief scale [1], via which we can detect internet addiction. The initial scale by Young along with the five positive answers criterion for the internet addict characterization was developed after studies on the gambling addiction scale which was then correlated to internet addiction. Further research by Young (1996) on the effects of the new tool on school reality noted a 58% alteration on students' study style, as well as indications of reduced performance which may even impede promotion to the next grade. The causes are as follows: the internet was initially introduced into schools as a tool providing students with the chance to discover knowledge, to communicate and practice skills. However, as noted by 86% of the teachers involved as well as librarians and informatics teachers, students' performance was not improved after their first exposure to the internet [25].

Materials and Methods

100 children (51 boys/49 girls) from 13 to 15 years

old (mean 14,3 S.D. 0,647) took part in the research. They were selected by free sampling from the High schools of the urban area of Volos. They were assessed by the Internet Addiction Diagnostic Questionnaire by Young (1996) [1] which has been adapted to the Greek language. The test includes eight yes/no questions. The examinee's addiction level is results from the sum of positive answers. In details, international standards for the tool use as well as Young's own measuring (1996) [1] reserves the internet addict characterization for any examinee with a sum of at least five positive answers. The same methodology was used by the research protocol conducted in the Neuropsychology lab of the University of Thessaly.

Statistical analysis of variance was used to detect the number of addicted to internet students. The analysis aimed at locating the average students' answers. We also used analysis of variance for one independent variable to locate how addicts' responses differ from non-addict ones. All statistical analyses were performed via the Statistical Package for the Social Sciences (SPSS [19]).

Results

Questionnaire Young (1996) [1] answers study indicates that 22% of the sample are addicted to the internet. The following graph illustrates the findings.

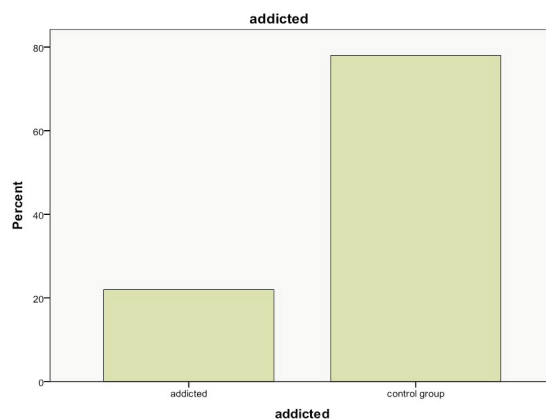


Figure 1. Percentage of adolescents addicted to internet.

In order to investigate the hypothesis that addicted children have different answers in Young's questionnaire compared the control group we proceeded an

analysis of variance for one independent variable (Anova) was employed, the independent variable being whether children belonged to an internet addicts group or to a control group. In the first question (Do you feel preoccupied with the internet?) $F(1,98) 99,70 p<0.001$. For the second question: (Do you need to use the internet with increasing amounts of time?) $F(1,98) 56,675 p<0.001$. For the third question: $F(1,98) 18,740 p<0.001$. For the fourth question: $F(1,98) 17,091 p<0.001$. For the fifth question (Do you stay online longer than originally intended?) $F(1,98) 6,931 p=0.01$. For the sixth question: $F(1,98) 20,950 p<0.001$. For the seventh question: $F(1,98) 42,809 p<0.001$. Finally for the eighth question: $F(1,98) 22,036 p<0.001$. It is thus clear that a 22% of research participants diagnosed by the test Young (1996) [1] as internet addicts present statistically significant differences in their answers when compared to others belonging to control groups. Participants' answers to the test are illustrated in the following graph.

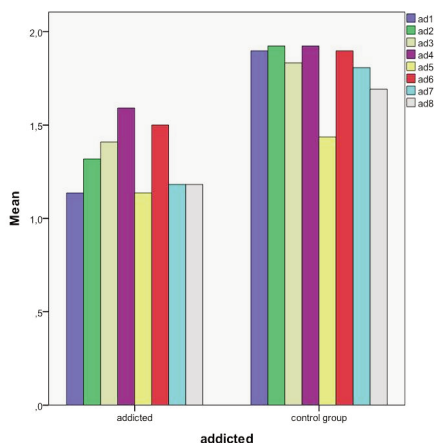


Figure 2. Average responses of young people who are addicted to internet (left column) and control group (right column).

A univariate statistical analysis of variance was performed in order to investigate the hypothesis that responses are differentiated according to the gender of the participant. No statistically significant differences in participants' answers were detected in research findings, as $p>0.05$. However, in question five participants: $F(1,98) 9,370 p<0.01$. Specifically, girls' positive answers were statistically more than boys'.

Furthermore, a univariate statistical analysis of vari-

ance was conducted in order to find out whether children's answers to the questionnaire are different according to their age. It was now found that children respond the same in all cases, the only exception was question 7 (Have you lied to a family member of yours in order to hide the extent of the problem) where $F(1,98) 3,40 p<0.05$. 14-year-old participants were found to give a positive answer to this specific question, in most cases. This becomes evident when compared to students belonging to different age groups.

A complete statistical analysis should also illustrate addiction frequency according to participants' gender, as depicted in the questionnaire. After the current analysis it was found that in the internet addicts sample derived from the questionnaire ($N=22$) 45,5% were boys and 54,5% were girls.

Also, as far as the ages of research participants diagnosed as internet addicted is concerned, the 54,5% was at the age of fourteen. The following graph presents the analogies of participants/ages.

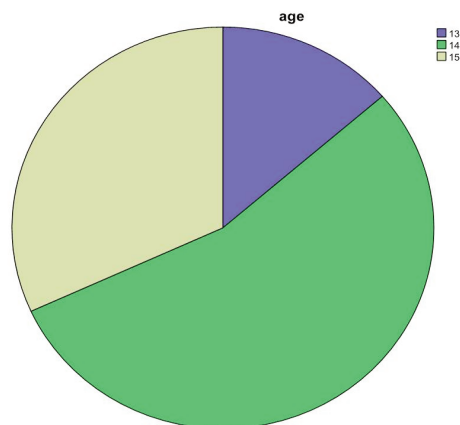


Figure 3. Aged ratios of participants who joined the group of children addicted to the Internet.

Lastly in order to investigate the reliability of the Greek translation of the test that was proceeded by the Laboratory of Neuropsychology we applied Cronbach's α . The result gave as 0.751 which is concerned as acceptable by the researchers.

Discussion

The test that illustrates the extent of the problem is

performed by quantity recordings via graded scientific scales which study internet addicts separately from members of control groups. In a random sample of 100 students from the urban area of Volos, a 22% was found internet addicts. Such a high rate indicates the extent of the problem that has already emerged [32,39,40]. High addiction levels classify Greece among the most addicted countries in the world. Quite characteristically in a 2012 research conducted in Hong Cong, among 3328 students aged 12.59 ± 0.74 , a 26,4% was found addicted to the internet [26]. International resources indicate a constant increase in the internet addiction rates [27,28,29]. Addiction to new technologies as configured by a study of the Greek Company for the study of Internet Addiction, reached the levels of 11%-16% for the year 2008. The city of Volos was found with the highest internet addiction rates [30], while a same 2009 research for Chios [31] produced an internet addiction rate of 15%. In a current research in Ko's island the addiction rate for students was 16,1 % while 2008 rates were 11,3% [32]. We thus observe a sharp increase in addiction rates, with the rates of Volos being even more high. This has to be attributed to numerous interrelated factors. Volos is quite a big city, this increasing students' alienation as well as internet accessibility. Furthermore, contemporary economic crisis, particularly in Greece, works towards the direction of increase in internet addiction rates, as the internet is the only means to escape from the problems of everyday reality with virtually no cost. The connection between internet addiction and the economic crisis should become the field of further research.

Our research proved that students' sex does not constitute a criterion which can adequately justify any increased or decreased possibilities of internet addiction, despite the fact that the problem severity was higher for girls. We may highlight that according to the statistical data of our research, internet addiction reaches the rate of 45,5% for boys and 54,5% for girls. In an earlier research conducted in China (2004) [33]

the same rates amounted to 56% and 44% respectively. In a similar 200634 research for China, the rates of internet addiction were 51,3 for boys and 48,7% for girls. The observable increase in girls' rates tends to balance the rates of the two sexes. Addiction rates as noted in a 2009 research in Chios [31] were similar to the findings of our research. More concretely, internet addiction was equally allocated to both boys and girls (50%). It was also found that girls tend to use internet applications providing communication (social networks, e-mails etc.) while boys are more vulnerable to online gaming [35]. This fact, along with the recent, rapid increase in social network applications may account for the dramatic increase in girls' addiction rates, compared to boys' ones.

It was found through the research that in a sample ranging from 13-15 years old, students with more than 5 positive answers out of 8 were at the age of 14 years old. More characteristically, 14-year-old internet addict rates reached 54,5%, with rates of 13 and 15-year-old students reaching together the rate of 45,5%.

Finally, we may acknowledge the restrictions of the research protocol applied. To be more specific, the sample of 100 children is quite limited, thus not fulfilling our wish to reach safe conclusions, representing the entire student population of the urban area of Volos. A research with a more extended sample at its disposition, including all schools of the Magnesian prefecture should be conducted.

The limited sample applied was used as a pilot in order to assess the success of test's adaption to the greek language. The validity and credibility of our findings are confirmed by the high rates of internet addict adolescents. Findings yielded from our research protocol will be applied in the research now conducted by the Neuropsychology Laboratory of the University of Thessaly. The protocol of this new research is bigger as far as number of participants and age range are concerned.

References

1. Young, K. S.). Internet addiction: The emergence of a new clinical disorder. *CyberPsychology and Behavior*, 1996; 1(3): 237–244
2. Nalwa & Anand Internet Addiction in Students: A Cause of Concern, *CyberPsychology & Behavior*, 2003; 6(6): 653-656.
3. Beard, K. W. Internet addiction: Current status and implications for employees, *Journal of Employment Counseling*, 2002; 39: 2-11.
4. Williams, A.L., & Merten, M. J. A review of online social networking profiles by adolescents : Implications for future research and intervention. *Adolescence*, 2008; 43(170): 253-274.
5. Beard, K. W. Internet addiction in children and adolescents. In C. B. Yarnall (Ed.). *Computer science research trends*, 2008: 59-70.
6. Kim, Jae Yop; Park, Soo Kyung; Cho, Choon Bum, Prevalence of Internet Addiction and Correlations with Family Factors among South Korean. Adolescents. *Adolescence*, 2008; 43: 895.
7. Young, K. S. Understanding online gaming addiction and treatment issues for adolescents. *American Journal of Family Therapy*, 2009; 37: 355 – 372
8. Goldberg, I. Internet addiction disorder, <<http://www.cog.brown.edu/brochure/people/duchon/humor/internet.addiction.html>>. 1996
9. Beard, K. W. , & Wolf, E. M. Modification in the proposed diagnostic criteria for Internet addiction. *CyberPsychology & Behavior* , 2001; 4: 377 - 383.
10. Greenfield, D. N. Psychological characteristics of compulsive internet use: A preliminary analysis. *CyberPsychology and Behavior*, 1999; 2(5): 403–412.
11. Modayil, M. V., Thompson, A. H., Varnhagen, S., and Wilson, D. R. Internet users' prior psychological and social difficulties. *CyberPsychology and Behavior*, 2003; 6(6): 585-590.
12. Suler, J. R. To get what you need: healthy and pathological Internet use. *CyberPsychology and Behavior*, 1999; 2(5): 355-393.
13. Young, K. S. Internet addiction: A new clinical phenomenon and its consequences. *American Behavioral Scientist*, 2004; 48(4): 402-415.
14. Young Kimberly S., Carl J. Case, Internet Abuse in the Workplace: New Trends in Risk Management. *CyberPsychology & Behavior*. 2004; 7(1): 105-111.
15. Young Kimberly S. Cognitive Behavior Therapy with Internet Addicts: Treatment Outcomes and Implications, *CyberPsychology & Behavior* 2007; 10(5): 671-679
16. Gresle & Lejoyeux. Phenomenology of Internet Addiction, Psychology of Emotions, Motivations and Actions Internet Theory, Technology and applications , e-book, 2001: 6-9.
17. Rachlin H. Why do people gamble and keep gambling despite heavy losses? *Psychological Science*, 1990; 1: 294-297
18. Walker. Some problems with the concept of "gambling addiction": should theories of addiction be generalized to include excessive gambling? *Journal of Gambling Behavior*, 1989; 5: 179-200.
19. Griffiths, M. The cognitive psychology of gambling. *Journal of Gambling Studies*, 1990; 6: 31-42.
20. Keepers, C. A. Pathological preoccupation with video games. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1990; 29: 49-50.
21. Lesieur, H. R., & Blume, S. B. Pathological gambling, eating disorders, and the psychoactive substance use disorders. *Comorbidity of Addictive and Psychiatric Disorders*, 1993: 89-102.
22. Morgan, W. Negative addiction in runners. *Physician and Sportsmedicine*, 1979; 7: 56-69.
23. Peele, S., & Brodsky, A. *Love and addiction*. Scarborough, Ontario: New American, 1979
24. Winn, M *The plug-in drug*. New York: Viking, 1983
25. Barber, A . Net's educational value questioned. *USA Today*, 1997: 4D
26. Shek, Daniel T.L. / Yu, Lu Internet addiction in Hong Kong adolescents: profiles and psychosocial correlates, *International Journal on Disability and Human Development*, Published Online: 27/02/2012 ,ISSN (Online) 2191-0367.
27. Levy, J., & Strombeck, R. Health benefits and risks of the Internet. *Journal of Medical Systems*, 2002; 26: 495–510.
28. Christakis, D. Internet addiction: A 21st century epidemic? *BMC Medicine*, 2010; 8: 61.
29. Siomos, K., Braimiotis, D., Floros, G., Dafoulis, V., & Angelopoulos, N. Insomnia symptoms among Greek adolescent students with excessive computer use. *Hippokratia*, 2010; 14: 203.
30. Siomos, K., Dafouli, E., Braimiotis, D., Mouzas, O., & Angelopoulos, N. Internet addiction among Greek adolescent students. *CyberPsychology & Behavior*, 2008; 11: 653–657.
31. Κυπαρίσση, Α. 1ο Πανελλήνιο Διεπιστημονικό Συνέδριο. Έρευνα – Πρόληψη – Αντιμετώπιση των κινδύνων στη χρήση του διαδικτύου, Λάρισα 27-29 Νοεμβρίου 2009
32. Siomos, Floros, Fisoun, Dafouli, Farkonas, Elena Sergeantani, Nikiforos Angelopoulo. Internet addiction in the island of Hippocrates: the associations between internet abuse and adolescent off-line behaviours, *Child and Adolescent Mental Health*, 2012; 17(1): 37-44
33. Shu Ching Yang, Chieh-Ju Tung. Comparison of Internet addicts and non-addicts in Taiwanese high school. *Computers in Human Behavior*, 2007; 23(1): 79-96
34. Cao, Su. Internet addiction among Chinese adolescents: prevalence and psychological features. *Child: Care, Health and Development*, 2007; 33(3): 275–281.
35. Louis Leung, Paul S. N. Lee, The influences of information literacy, internet addiction and parenting styles on internet risks. *New Media & Society*, 2011; 14(1): 117-136.
36. Mehroof, M., & Griffiths, M. D. Online gaming addiction: The role of sensation seeking, self-control, neuroticism, aggression, state anxiety, and trait anxiety. *Cyberpsychology, Behavior, and Social Networking*, 2010; 13: 313–316.
37. Shapira, N., Lessig, M., Goldsmith, T., Szabo, S., Lazoritz, M., Gold, M., et al. Problematic internet use: Proposed classification and diagnostic criteria. *Depression and Anxiety*,

- 2003; 17: 207–216.
38. Tsitsika, A., Critselis, E., Kormas, G., Filippopoulou, A., Tounissidou, D., Freskou, A., et al. Internet use and misuse: A multivariate regression analysis of the predictive factors of Internet use among Greek adolescents. *European journal of pediatrics*, 2009; 168: 655–665.
39. Young Kimberly, S. Psychology of computer use: xl. Addictive use of Internet : A case that breaks the stereotype, *Psychological Reports*, 1996; 79: 899-902.
40. Young, K., & de Abreu, C. *Internet Addiction: A Handbook and Guide to Evaluation and Treatment*: Wiley, NJ., 2010