The popular stereotypes surrounding various types of hacking and computing addictions suggest that "addicts" tend to be socially unskilled male teenagers who have little or no social life and/or self-confidence - is this really true?

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Excessive Internet and computer use: Implications for education

Three case studies show that excessive computer usage appears to have a detrimental effect on educational progress.

Information technology has been steadily growing in importance in education rising from a minority option to a compulsory subject in the National Curriculum.

S tories in the media about the Internet generation appear to be on the increase. This appears to include both the Intenet's upside (particularly educational usefulness) and downside (excess pornography, Internet addiction, gambling etc.).

Both the leading political parties in the UK are committed to providing Internet access for every school in the country. However, many parents and teachers are worried that the ease of access to exploitative material for children is a major concern. For example, the Internet allows everyone to set up their own web pages at a very low cost and there is a vast amount of soft and hard-core pornography available all over the world, much of it amateur and most of it free. However, the Internet, by its very nature, is outside the jurisdiction of any one government.

Most people will be aware that computers were first introduced into schools in the early 1980s. Since then, information technology (IT) has been steadily growing in importance in education rising from a minority option to a compulsory subject in the National Curriculum.

In 1997, the Labour Government launched the National Grid for Learning (NGfL) which has the aim of connecting all schools to the Internet by 2002. This kind of national initiative has the sole aim of getting children acquainted with IT as early as possible.

No-one can deny that IT skills should be an

Fool's Gold: A critical look at computers and childhood

This report provides a fascinating insight into the work of a coalition of child experts in the United States - 'The Alliance for Childhood'. The authors challenge the increasing emphasis on computers in early childhood and in the classroom. "Dozens of leading health, education and child development experts" in the USA suggest that exposure to computers poses a serious threat to the physical, emotional and development of children.

The report suggests that healthy child development means time for active, physical play including hands-on lessons of all kinds (especially in the arts) and direct experience of the real world. The authors claim that many American schools have cut back in these areas and shifted time and money to expensive, unproven computer technology.

The authors question the impact that educational technology has made finding only one clear link between computers and child learning. After 30 years of research into educational technology "there is no clear commanding body of evidence," that children's sustained use of ICT has any impact on academic achievement. The only connection that computers make to children is often to trivial games, inappropriate adult material and aggressive advertising.

The report calls for a re-examination of education priorities and questions the spending on unproven technology. The funding needs to return to proven educational programmes which include book purchases, and essential classroom materials for the arts, sciences and physical education.

For details see www.allianceforchildhood.net

important part of children's educational development. However, there seem to be endless numbers of questions that we need to answer before proceeding at the current pace. For instance, should the seemingly growing emphasis on IT be continued at the expense of more traditional classroom learning experiences? Is the Government's idea to increase the amount of classroom work done on computers going to breed a new generation of children who have forgotten how to hold a pen? Should we be introducing children to computers from the earliest age possible? Will computers ever replace teachers?

Today's teenagers live their lives in a multi-media world and are more "screen-ager" than teenager.

"Screen-age" generation

There is no doubt that children's day-to-day leisure habits have changed dramatically in the last 20 years. Today's modern teenager may well have a television, CD player and computer game console in their bedroom and an increasing number will have on-line access to the Internet at home. In essence, today's teenagers live their lives in a multi-media world and are more "screen-ager" than teenager. What is the long-term effect of this change in children's leisure behaviour?

"Chat rooms"

Perhaps one of the major dangers for children are when they are in Internet "chat rooms". In the US there are a number of cases where children have been lured to meet someone that they met in a chat room only to find it was an adult pretending to be a child.

Alternatively, children who engage in playful and exploratory word searches can come across hardcore pornography quite accidentally. For instance, a recent case involved thousands of American children being exposed to very hardcore pornography after typing in the word "Bambi". Other less obvious danger areas include being recipients of flaming (i.e., receiving verbally abusive e-mail messages) and invitations to join services related to financial gain ("spamming").

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Technological addictions

Further to this, it has been alleged that social pathologies are beginning to surface in cyberspace, i.e. technological addictions (Griffiths, 1996a; 1997). Technological addictions are operationally defined as non-chemical (behavioural) addictions which involve human-machine interaction. They can either be passive (e.g. television) or active (e.g. computer games) and usually contain inducing and reinforcing features which may contribute to the

promotion of addictive tendencies (Griffiths, 1995).

This author's view is that technological addictions are a subset of behaviourial addictions (Marks, 1990) and that behaviourial addictions feature the core components of addiction, i.e., salience, mood modification, tolerance, withdrawal, conflict and relapse (see Griffiths, 1996b).

Salience: This occurs when the particular activity becomes the most important activity in the person's life and dominates their thinking (preoccupations and cognitive distortions), feelings (cravings) and behaviour (deterioration of socialized behaviour). For instance, even if the person is not actually engaged in the behaviour they will be thinking about the next time they will be.

Mood modification: This refers to the subjective experiences that people report as a consequence of engaging in the particular activity and can be seen as a coping strategy (i.e. they experience an arousing "buzz" or a "high" or paradoxically tranquillising feel of "escape" or "numbing").

Tolerance: This is the process whereby increasing amounts of the particular activity are required to achieve the former effects. For instance, a gambler may have to gradually have to increase the size of the bet to experience a euphoric effect that was initially obtained by a much smaller bet.

Withdrawal symptoms: These are the unpleasant feeling states and/or physical effects which occur when the particular activity is discontinued or suddenly reduced, e.g. the shakes, moodiness, irritability etc.

Conflict: This refers to the conflicts between the addict and those around them (interpersonal conflict) or from within the individual themselves (intrapsychic conflict) which are concerned with the particular activity.

Relapse: This is the tendency for repeated reversions to earlier patterns of the particular activity to recur and for even the most extreme patterns typical of the height of the addiction to be quickly restored after many years of abstinence or control.

The popular stereotypes (see Rheingold, 1993) surrounding various types of hacking and computing addictions (e.g. Turkle, 1995) suggest that "addicts" tend to be socially unskilled male teenagers who have little or no social life and/or self-confidence.

Recent surveys have confirmed that a vast majority of Internet users are in fact male. A survey by Pitkow and Kehoe (1996) indicated that 32% of Internet users access the Internet

through education providers and that 28% of Internet users are college students. Two recent studies have examined excessive Internet use among a US student population. Although unrepresentative of the general public, students are considered high-risk for Internet problems because of ready access and flexible time schedules (Moore, 1995).

Pathological Internet users

Morahan-Martin and Schumacher (1997) examined what they termed "pathological Internet use" (PIU) in 277 students. Pathological Internet users accounted for 8.1% of the total sample and were more likely to be male (12.2% males; 3.2% females) and to use technologically sophisticated channels and online games etc.

Scherer and Bost (1997) surveyed 531 students about their Internet use and developed a checklist of ten clinical symptoms to parallel the symptoms of substance abuse and dependency. Results indicated that 49 respondents (13%) of weekly Internet users scored three or more on the dependency checklist and that the majority of these were male (71%). Thirteen percent of the sample reported Internet use had interfered with either their academic work, professional performance or their social lives.

Previous research (Griffiths, 1995; 1996a; Griffiths & Sparrow, 1997) has shown that the Internet may be addicting. As mentioned previously, anecdotal evidence indicates that the typical "addict" is a teenager, usually male, with little or no social life and little or no self confidence (Turkle, 1995). However, recent work suggests there are individuals who do not fit this stereotype (Young, 1996).

Case studies

Three case studies of excessive computer usage have been collected by the author. Each of the outlined cases has been given a pseudonym and a one line demographic description (i.e. age, gender, nationality, status). Information is also given about the origin and source of the case study. Each case is also followed by a brief commentary. Implications for education will be discussed in the final sections of the paper.

"Gary"

Demographic profile :
15 year old British male (at school)
Source of account :
Author contacted by subject's mother having heard about author's research on a national radio programme.
Origin of data :
Written correspondence

Gary is an only child and spends many

Gary has always had problems socially...His parents feel he views his computer as a "friend" and therefore tends to spend a lot of his time on the machine.

hours on his home computer averaging at least 3-4 hours a day in school term, with up to 5 or 6 hours or more a day at weekends. During the school holidays it increases even more, especially because he is on his own in the house whilst his parents are at work.

Gary's mother describes him as "extremely good technically, very bright and very good at computer programming". His mother claims "he is computer mad, but not for computer games, rather for serious computing - programming etc."

His GCSE homework has been increasingly suffering because of the time he spends on his computer. When he is not working on his computer, he watches television.

Gary suffers from neurofibromotosis, a condition which can produce severe behavioural problems to varying degrees. According to his mother, Gary has always had problems socially. He has had difficulty in making friends, difficulty in coping with teasing and minor bullying (usually of a verbal nature). His parents feel he views his computer as a "friend" and therefore tends to spend a lot of his time on the machine.

Gary also suffers from an inferiority complex and lack of confidence when dealing with his peers and as a consequence gets very depressed. This condition worsened when he got his own computer. At the same time, his general behaviour worsened. He refused to do his normal household chores when requested, was generally awkward and difficult, and provoked confrontational situations between himself and other members of the family.

He spends as much time with the computer to the exclusion of family and friends. His parents had his GP refer him to a psychiatrist for counselling and help. While Gary viewed this as a possible "quick fix" for his problems it was very slow progress and is still getting the help of the local psychological services.

His mother thinks that a lot of his lack of confidence stems from the fact that he is content to spend his time in his room to the exclusion of others in his own world. She sees the problem as "a self-induced Catch-22 situation" in that he will never make friends whilst he spends time alone, but the action of spending time alone reduces his ability to deal with other people.

Gary's own view is that he has not got a problem with his computer use and that he does not spend too much time on the computer. There is no doubt that this appears to be an unusual case and that Gary's excessive time spent on the computer appears to be symptomatic of other underlying problems.

Commentary

Gary appears to fit the stereotype of a computer "addict" in that he is a male teenager who appears to have little or no social life and little or no self confidence. He appears to use the machine as an "electronic friend" - a behaviour which has been reported with other technological products like video games (Selnow, 1984) and slot machines (Griffiths, 1995b). He appears to display all the core components of addiction and, like many "addicts", denies he has any kind of problem. His primary motivation for excessive use of his computer appears to be some sort of escapism into his own world where he can counteract his depression and forget about his social isolation and his medical condition.

"Jamie"

Demographic profile :
16 year old British male (at college)
Source of account :
Subject appeared on television programme (about Internet addiction) with author and continued correspondence.
Origin of data :
Face-to-face interview and written correspondence via Internet

Jamie is an only child and lives alone with his mother. There appears to be few problems in Jamie's family life although his mother divorced his father when Jamie was three years old. Jamie has no physical problems although he is very overweight. Jamie spends around 70 hours a week on his computer including 40 hours on the Internet. This includes two twelve hour sessions at the weekend. Only three hours a week is spent on work-related activities. Jamie's usual pattern is to log on between 2pm and 4pm in the afternoon and log off between 1am and 5am in the morning. He describes himself as "sci-fi mad" and spends "hours and hours" taking part in Usenet discussion groups about the television programme Star Trek (and its spin-offs). Although he had played computer games when he was younger, Jamie first used a computer properly when he was 14 years of age. He used the computer for about 10 months before getting a modem to access the Internet. As a consequence of his excessive Internet use, the house telephone bills are large.

Jamie claims the Internet is the most important thing in his life, and that he thinks about it even when he is not using it. He claims the Internet can change his mood - either calming him or exciting him. He gets withdrawal symptoms if he cannot get Internet access. When trying to cut down or quit he finds the lure of cyberspace too strong to resist ("I get very

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irritable and I start to shake"). However, he does not view himself as an "addict".

Jamie says he has difficulty limiting or controlling the time both on and offline. Over a two year period he has upgraded his computer eleven times. He says "I log on literally until I am physically unplugged by someone else...I can't work or live without it - my social and intellectual life are linked directly to it". If he's not connected - even for a short length of time, he worries he no longer knows "what is going on".

Jamie's use of the Internet causes irregular sleeping patterns. It doesn't bother him that he has become nocturnal in order to use the Internet when the telephone charges are low. Occasionally he oversleeps and misses college because of his computer usage. He has tried to quit the Internet - once giving up for three days - but the pressure to log back on proved too great.

If Jamie was not online, he feels he would not use that time to meet people in real life ("I tend not to socialise much"). He has no friends outside of those he meets on Internet Relay Chat (IRC) and has no desire to make any. Jamie uses the Internet for a variety of different chat methods (e.g. IRC and Westwood Chat as well as the Web and newsgroups). Jamie claims he uses these services "to meet lots of people". He feels that the Internet has improved his level of knowledge and intends to enter an Internet-related field of employment.

Commentary

Jamie - like the case of Gary above - appears to fit the stereotype of an Internet "addict" in that he is a male teenager who appears to have little or no social life, little or no self confidence, displays all the core components of addiction, and denies he has any kind of problem. However, Jamie claims to have "friends" although all of these are "net friendships". His passion for science-fiction echoes research carried out by Wolfson (1995) who found that obsessive fans of the television programme Star Trek use the Internet extensively. Jamie's primary motivation for using the Internet excessively is to socialise with other Internet users. It may be the case that Jamie feels comfortable in the text-based (non face-to-face) world of the Internet because of his obesity.

"Panos"

Demographic profile :
20 year old Greek male (at university)
Source of account:
Subject contacted author via an Internet discussion group

Origin of data :
Written correspondence via Internet

Panos has played on computer games since he was a small child. As an only child he got almost anything he wanted when he was younger, including all forms of electronic technology. He recalls that as a child he had a small computer which he used to play games on but used the computer for nothing else. Panos claims that at that particular time in his life, he had become "addicted" to the games he used to play. He played the games to the neglect of everything else in his life. He now believes that people can become addicted to computers as well and that the escapism he felt as a young boy is now being recreated via his use of the Internet - particularly through the playing of fantasy role playing games (like Dungeons and Dragons type games) and through the use of chat rooms. As Panos says :

" I was 100% sure that you could become addicted to a computer only by playing games. I thought that it is was impossible to become addicted to a computer by using it for professional purposes. Many years later I came to England to study Chemistry and I soon realized that I couldn't do without computers. But this time it was not playing games. Gradually, I discovered the huge world of Internet and its many uses and applications. I used to go to the computer only to word process and print but now I am spending many hours every day exploring Internet, in addition to sending numerous e-mails and doing stuff that in fact (for entertainment) and to my opinion can ruin somebody's life."

Panos feels his whole life revolves around computers and that he feels comfortable being in this country when he is on the Internet. He claims that using the Internet excessively helps him cope with every day life as a university student. He spends an average 40-50 hours a week on the Internet but has no financial problems because he accesses the Internet for free from his university. His studies have suffered considerably as he spends so much time on the Internet leaving him little time to get on with his degree work.

"...I soon realized that I couldn't do without computers...but this time it was not playing games...I discovered the huge world of Internet and its many uses and applications."

Commentary

Panos, to some extent, appears to fit the stereotype of an Internet "addict" in that he is a young male who appears to have little or no social life, and little or no self confidence. However, he appears to display only some of the core components of addiction (salience, conflict, mood modification, and possibly tolerance), and, unlike the previous two cases, he does not deny he has a problem surrounding his Internet usage. The primary motivation for excessive Internet usage is to cope with the fact he is in a

foreign country in which he has very few friends and very much uses the Internet for escapism and socializing.

However, it is interesting to note that Panos claimed he was once "addicted" to computer games as there have been a number of models putting forward a developmental account of person-machine relationships (e.g. Brown, 1989; Griffiths, 1991). It is perhaps unsurprising that as a former computer game "addict" that it should be the fantasy role playing games that Panos uses the Internet most excessively for. A fairly recent study of fantasy game players found that that the time spent on such games was "considerable" and that they were more introverted and more likely to "play with computers" and be computer game players than controls (Douse & McManus, 1993).

General discussion

Of the three cases outlined, possibly only two of them (Gary, Jamie) were 'addicted' according to the addiction components criteria. However, whether they can be labelled as "addicted" or not, it is obvious that their education (whatever the level) is/was suffering as a result.

This is clearly an area for future research - not only to investigate the impact on educational outcomes, but also more generally to assess impact of excessive computer use in other domains such as social skills (which in itself may impact on education). In the search for commonalities, it is also worth noting that the three young males were all only children who appeared socially isolated and had few social skills.

These factors may or may not have had an influence in excessive computer use. However, the psychotherapist Rawlins (1995) has specifically reported some positive attributes through intensive Internet use. Rawlins sees many children who fit the criteria for Pervasive Developmental Delay or Atypical Autism. She reports that these children often "fit in hand and glove" with computer technology. They already have poor social relatedness and are rather isolated individuals and she argues that net use may actually augment and help their social interaction.

In more general terms, there seems to be a movement which automatically views IT as the way forward on lots of things (particularly in education) and that the only way of self-betterment amongst our children is through more and more IT use.

There is little good reason to assume that more always means better. It is this author's belief that children at school need an integrated

balance between computer-assisted learning (including the development of IT skills), traditional learning methods (paper and pen, the three 'R's' etc.), physical sporting activities, and enhancement of play and peer development.

That is not to say that computers and the Internet do not have their positive side. Computers can :

✓ be fun and exciting providing an innovative way of learning

✓ provide elements of interactivity which can stimulate learning

✓ provide elements of curiosity and challenge which can be crucial to learning

✓ equip children with state-of -the-art technology

✓ overcome techno-phobia (a condition well-known among many adults)

✓ eliminate gender imbalance in IT use (males tend to be more avid IT users)

✓ help in the development of transferable IT skills

However, on the down side, computers (including Internet use) can :

✗ be socially isolating (perhaps leading to increased shyness)

✗ be socially limiting (perhaps leading to physical inactivity and obesity)

✗ be time-consuming, engrossing and in extreme cases addictive

✗ provide easy accessibility to exploitative material (e.g. Pornography)

✗ provide easy accessibility to adult activity (e.g. Internet gambling)

✗ provide IT skills that quickly change or become obsolete

✗ cause repetitive strain injury (RSI)

✗ produce "sloppiness" (i.e. computers can correct spelling and grammar)

As can be seen by the list of "negatives", some of the problems are not from the IT medium itself but from what children can do in that medium (e.g. access pornography). Teachers need to be aware of IT's limitations and need to put safeguards in place to protect children from unwanted exposure to adult material.

There is no doubt that Internet usage among the general population (as well as those involved at all levels of education) will start to increase over the next few years and that if social pathologies do exist then this should be of interest and concern to all those involved in the education system.

To re-iterate and expand on above, there needs to be integration between lots of different activities (not just IT) and for there to be a balance between IT and traditional education so that they can combine to form a richer experience for the children of tomorrow. IT is set to

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have a large impact in the lives of our children.

What teachers need to concentrate on is not what to learn but how to learn. This in itself will have an impact on both the role of teachers and the contribution that parents can make. To some extent, this all sounds somewhat idealistic.

In general, schools at present have too few IT resources and it is highly improbable that the NGfL scheme will be workable (for instance, will the £100 million investment be wiped out with software costs alone?). However, we should not let such negative thoughts and problems stop us at least trying.

"Netiquette"

Teachers need to know the potential dangers and children need to know how they should conduct their time spent online.

A recent guide produced by the National Children's Home has provided essential "netiquette" on such matters specifically aiming it at children (table 1 - from NCH Action for Children - Children on the Internet : Opportunities and Hazards, 1998).

Table 1 : Guidelines for children on how to be safe on the Internet

1	Never tell anyone that you meet on the Internet your home address, telephone number or school's name unless you are given permission by a parent or carer.
2	Never send anyone your picture, credit card or bank details (or anything else).
3	Never give your password to anyone - even your best friend.
4	Never arrange to meet anyone in person that you have met on the Internet without first agreeing it with your parent or carer.
5	Never stay in a chat room or in a conference if someone says or writes something which makes you feel uncomfortable or worried. Always report it to your parent or carer.
6	Never respond to nasty, suggestive or rude e-mails or postings in Usenet groups.
7	If you see bad language or distasteful pictures while you are online, always tell your parent or carer.
8	When you are online, always be yourself and do not pretend to be anyone or anything you are not.
9	Always remember that if someone makes you an offer which seems to good to be true - then it probably is.

Parents and teachers should read the guide to be "cyberwise" as well as streetwise. The issues raised in this article are not meant to be alarmist but have been highlighted to raise awareness amongst educators of Internet issues particularly concerning excessive computer usage.

These issues need explicitly stating as there may be a "technological generation gap" between parents and children (and maybe even a gap between children and some teachers). Everyone involved with the contemporary technological issues needs to be both educated about the Internet as well as being educational with the Internet.

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