REPORT ON THE IMPACT OF INFORMATION TECHNOLOGY ON SOCIAL STRUCTURES

ABSTRACT

This report describes the development of the Internet and its technology, and its implications for our social structures, with a particular focus on family life and education.

Use of the Internet in the home environment has given rise to concerns regarding social isolation of families, exposure to inappropriate material and invasion of privacy through undisclosed use of personal data. In contrast, the Internet has been recognized for fostering new dynamics within the family structure by introducing a more even distribution of authority within the family and increased whole family learning.

The report highlights that the introduction of the Internet, as a teaching implement, will change the classroom environment, as well as the teacher-pupil relationship. However, the presence of the Internet in schools is still being researched and evaluated.

INTRODUCTION

The Internet and its technology such as email and the WWW, are fast entering the mainstream of society. Key to understanding the impact of the Internet on social structures is the rapidity with which the technology is both diffusing and simultaneously, changing. The Internet has moved very recently from being confined to the workplaces of professionals to take its place beside the television as a family resource in the homes of the majority of schoolchildren.

The rapidity of these changes is accompanied by uncertainty regarding the implications of the Internet on social structures. Parents, teachers and policy makers alike, whilst recognizing the

liberating and empowering possibilities of the Internet, are also deeply concerned about how this new resource should be managed and controlled. This report seeks to discuss the impact of the Internet on the social structures of family life and education. Issues concerning the growing use of the Internet and its technology in the home and school environments are critically examined.

DEVELOPMENT OF THE INTERNET

The history of the Internet dates back as far as 1969, when ARPANET, the network set up by the US Defence Department, became the foundation of a global, horizontal communication network of thousands of computer networks (comprising over 300 million users in 2000 that has been appropriated for all kinds of purposes by individual and groups around the world (Castells, 2000:7). Since the Internet was funded mostly by government money, for almost three decades it existed for the exclusive use of government, research, and higher education personnel. However, following the introduction of commercial Internet in 1983, this changed slowly, as more and more everyday people became aware of the Internet.

By the end of 1991, dozens of entrepreneurs had established *Internet Service Provider* (ISP) businesses, which offered low-cost Internet access to families, businesses, and schools. The Internet has now developed into an international network of computer systems that talk to each other using a defined communications protocol, allowing users to access facilities such as e-mail and the World Wide Web (WWW).

HOW DOES THE INTERNET WORK?

The Internet is often confused with some of the applications, which run on it, such as *E-Mail, World Wide Web and File Transfer Protocol (FTP)*. This section seeks to clarify the various developments of the Internet and their uses.

To enable computers connected to the Internet to communicate and understand information exchanged between them, they all use the same standard (protocol), known as the *Internet Protocol* (IP). Each computer on the Internet can be uniquely identified by its Internet Protocol (IP) address (for example, 120.218.38.8). *File Transfer Protocol* (FTP) is used as the basis for programs which allow the transferring of files, in either direction, between one computer and another remote computer connected to the Internet. Files can include word-processed documents, spreadsheets, databases, software, etc.

The *World Wide Web* (WWW) is the system which allows text, graphics, sounds and moving images to be shared between and displayed on computers on the Internet. The WWW is based on a protocol called *HyperText Transfer Protocol* (HTTP), which is the mechanism which allows such Web information to be transferred over the Internet. It uses software called a client or browser to retrieve and display information on a screen.

Electronic mail (email) is the most basic and widely used facility available on the Internet. It allows users to mail one or more people anywhere on the Internet, provided they know the recipients email address. There are a number of electronic media which allow people with similar interests to discuss topics in a similar way to electronic mail. These include mailing lists (also called discussion lists) and newsgroups.

Data is sent between networks along telephone lines and between continents using satellite links. This is allowing the WWW to exist as an ever-growing library of information supplied by individuals or organisations that can be easily accessed at home via a computer with a modem connected to

an *Internet Server Provider* (ISP). Also, the Internet continues to evolve with it becoming available on mobile phones, pagers and increasingly, on televisions.

THE IMPACT OF THE INTERNET ON FAMILY LIFE

The number of UK households with domestic access to the Internet has grown rapidly, reaching some 9.2 million households by the last quarter of 2000 (Livingstone and Bovill, 2001)

Whereas in the past, proximity has affected the structure of families, the Internet allows family members to use email and chat rooms to keep in touch with relatives in other countries and as a result communication within extended families is now much greater than ever. Most Internet users use email, and have undoubtedly increased their 'conversations' with family and friends through this medium. Rather than de-personalising and undermining the family, technology is promoting the use of electronic networks to maintain and bolster family connections (Future Foundation, 1998).

Traditionally, parents are viewed as authority figures and considered more knowledgeable than their children in virtually every domain. Children often catalyze Internet use by other family members and become a source of expertise within a household. Therefore, Internet use in the home is bringing rise to the notion of children teaching their parents and roles within families are now allocated on basis of skills and availability, rather than traditional gender or hierarchical prejudges (Future Foundation, 1998). This has created a more even distribution of power within families as parents and children now share authority of different areas of their lives. As a result, more of a peer dynamic has been created within families as parents begin to respect their children for their individual authorities. This may not mean that parents abandon their role as parents but rather that there is a trend towards more discussion, consensus and family learning.

IMPACT ON FAMILY LIFESTYLES

Nie and Erbring (2000) argue that 'the Internet could be the ultimate isolating technology that further reduces many families participation in communities, even more than television did before'. The Internet holds the promise of strengthening the family by moving many family activities dispersed by industrial society back into the home environment. These include working, learning, shopping, entertainment and health care. In contrast as Internet use increases, Americans report that they spend less time with friends and family, shopping in stores, or watching television, and more time working for their employers at home, without decreasing the hours they spend physically at work. Parents are able to telecommute over the Internet, allowing them to choose where to live based on quality of life and not proximity to work. Subsequently, many, cities view the Internet as a solution to their clogged highways and air pollution as less people drive to work and sit in traffic. Families see the Internet as a way to acquire goods and services and to investigate things they would like to but or enjoy. The Internet allows families greater access to information about products and services and it is often used for browsing for products, checking prices, and even executing transactions. Some would suggest that the Internet encourages families to get into more debt by allowing increased times for spending money, more direct advertising to encourage impulse buying and facilities for easier applications for loans and credit cards. Although these issues may be detrimental to some families they can be of great benefit to increasing the independence of people with disabilities or additional needs. For example, a person who needs additional help to access a supermarket for shopping can order exactly what they need and have it delivered to their home at the click of a mouse.

The Internet is gradually heading towards being integrated with other computer technology to everyday family life simpler, i.e. household appliances and family vehicles, often without the user's knowledge.

INVASION OF PRIVACY

The convenience of using the Internet has seemingly made some families' lives easier but it can be argued that this results in the loss of privacy of personal information. There is potential of an unprecedented and very dangerous destruction of everything that families have come to know as their right to privacy. Bennahum (1996) cited in Loader (1997:5) indicate 'that whilst some uses of the Internet, such as encrypted person-to-person email, invited relay chat or video conferencing and password protected file transfer protocol or WWW sites may be relatively private, others, such as email-based distribution lists, Usenet groups and WWW pages, are more public in orientation'. For example, a web-based forum based on helping a family with their plumbing problems may have been set up by a business as an indirect way of gaining addresses and information for the purpose of selling plumbing products to families.

Most people are aware of the Internet's benefits, but not everyone is aware of how the Internet can threaten personal privacy. Tracking on the Internet can provide information on websites visited, item purchases, communications and duration of Internet usage. A cookie is a piece of text that a Web server can store on a family's hard disk allowing a Web site to store information on a family's machine and later retrieve it. This practice started receiving tremendous media attention back in February 2000 because of Internet privacy concerns, and the debate still rages. The information stored in a family's cookie file is only anonymous until family members supply personally identifiable information to a particular site and often sites share information. Mainly, businesses

use this information to create profiles about potential customers in order to develop better products to meet the needs of families, to enter new markets and compete with other companies. However, this practice tends to lead to the average Internet-using family receiving unwanted email, banner ads and post which relates to the areas in which they have been researching on the Internet.

SOCIAL DEVELOPMENT OF FAMILIES

Children are using the Internet for activities, which are usually associated with our understanding of what constitutes a traditional childhood including playing, learning, communicating and forming relationships. As Tapscott (1998:6) indicates 'children can become enthralled with new worlds and tools, at the expense of other healthy or important activities, such as socializing.

He argues that children without access to the Internet will be developmentally disadvantaged. While on the Internet children are having fun playing, they are also developing as opposed to watching television. Time spent on the Net is not *passive* time; it's *active* time for reading, writing, investigation, problem solving, analyzing and evaluating.

When considering how children are spending their leisure time, studies show that children often use computers to 'fill time' and 94 per cent of children would rather play outside (Gill, 1996:105). Parents' anxieties and concerns around allowing their children to play outside without their constant supervision could provide an explanation for children's continued use of the Internet regardless of their preference to do other things. After the many reports of child abductions in so called 'safe places' such as local playgrounds and parks, it is hardly surprising that many anxious parents are introducing the Internet into their homes in order to offer their children something else to do. Meanwhile, the children in today's society are growing up without the play experiences that many adults took for granted in their own childhood.

EXPOSURE TO INAPPROPRIATE INFORMATION

Since no single controlling body regulates the Internet, many dangers can jeopardize the Internet's credibility. Although the media often exaggerates the situation, there is some degree of danger of exposure to inappropriate material, unpleasant experiences or predators. Some youth may participate in *cyber sex* or may take their parents' credit cards without permission to make purchases, but it can be argued that this is no different to the activities of young people in the *real world*.

Many would argue that software packages, such as Net Nanny, could prevent access to unsuitable websites and therefore lower children's exposure. However, it is important to consider that the divide in knowledge between parents and children can lead to the task of installing an online safety program being assigned to the child. Many parents are oblivious to the fact that whoever sets up the online safety system will actually control its settings and as a result the software may not be particularly useful in preventing access to inappropriate WebPages.

Tapscott (1998:243) suggests that 'the issue of inappropriate material on the Internet raises a wonderful opportunity to be a good parent, to share our values with children, and to create open relationships'. This is reinforced by Aftab (2000: 130) who suggests that 'any discussion about pornography on the Internet has to start with the doctrines of freedom of expression and recognition that much of the sexually explicit content we encounter online may not be illegal.' It means that families are now largely responsible for controlling their children's access and exposure to information that they feel is inappropriate.

The Internet allows potential criminals such as pedophiles and thieves, access directly into the homes and lives of families via chat rooms, email and family Websites. It could be argued that

abuse of children will never be fully controlled and the Internet provides a safer environment for children as they have complete control over any situation as they can always disconnect from potential harm by turning off their computer. Statistics also illustrate that children are 300,000 times more likely to be abused by one of their own relatives than by someone they have met via the Internet (Tapscott, 1998:245). However, Governments are lagging behind in thinking about the implications of the Internet on policies *cyberporn* and *cyberpredators*.

The Internet also allows young members of families, particularly, to have more independence when growing up as they can initiate access to more information about issues, which they may not normally feel comfortable discussing with their parents, such as illnesses and birth control. Some would argue that this discourages discussion and open relationships within families but others would suggest that the increase in awareness of important issues is extremely beneficial to those families who find it difficult to talk about embarrassing issues.

INCREASED SOCIAL INCLUSION

In addition to its commitment to a more inclusive society, the Government has set itself a very public target of achieving universal access to the Internet by 2005. The Internet opens up new ways to empower service users in families. Hellawell (2001:19) indicates that the Internet is an effective way of providing abundant information to parents and carers: about where to get help and advice locally, about nearby support groups'. Those families who have members with additional needs can gain access to information in an unintrusive environment and therefore feel empowered in their individual situation. Through using the Internet families can gain contact and communicate with families in facing similar circumstances, which can provide valuable emotional support. Also, family members who have additional needs can often communicate with others via the Internet and

find out the most up-to-date information about services in their local community, which in turn encourages inclusion in society.

THE DIGITAL DIVIDE

The Internet could foster a two-tiered society, creating a 'digital divide' or a major gap between those who can communicate with the world and those who can not. For example, there is a direct relationship between family income and access to computers and the Internet. This correlation also exists between higher and lower income schools. Whereas Government initiatives to allocate funding for Internet access for all suggest that this may be a temporary situation, Tapscott (1998:11) suggests that 'the digital divide is actually widening, not disappearing.' This could be the case when considering that as the Internet enters the lives of those living and attending schools in poorer communities, the families earning a higher income are obtaining improved access in the form of a wider range of services, faster connections such as broadband, more efficient technology and, most importantly, increasing motivation, skills, and knowledge. This only exacerbates the divide in families from different economic classes' capacity to learn and have successful lives.

PREVALENCE OF INTERNET USAGE IN EDUCATION

The Internet is an innovative piece of information technology that serves many purposes. In fact, it is now being utilised in classrooms as a tool for learning. RM (2000) indicates that 'during 1998-2000 the Government provided £205 million to be spent on improving Information and Communications Technology (ICT) in primary and secondary schools in England and to build the National Grid for Learning (NGfL), which aims to help learners and educators in the UK to benefit from ICT. It is a vital part of the Government's commitment to the creation of a connected learning

society in which learning is increasingly accessible and adapted to individual needs (Becta, 2001). As set out in a 1997 consultation paper, the Governments aim was to connect all schools to the Internet by 2002, however, by 2000, 98 per cent of secondary schools and 86 per cent of primary schools were already online (Livingstone and Bovill, 2001).

Due to the fact that many workplaces use the Internet, it makes sense that the education system should incorporate Internet skills into their curriculum. This has been recognized by the Government and subsequently, use of the Internet, both as a source of information and a way to communicate with others, has been built into the National Curriculum guidelines;

- At age 7-11 pupils are expected to be able to use email, and talk about how they would find information on the Internet.
- By 11-14, pupils should be able to share/exchange information using email/web-publishing and know how to evaluate a website.
- At 14-16, pupils are to be taught the more complex skills of how to reflect critically on the impact of e-commerce and to use their initiative to exploit the potential of new sites on the Internet. (Source: DfEE, 1998)

The incorporation of the Internet and its technology into the classroom is not a new idea. Teachers supported early technologies such as blackboards and desks because they made it easier for teachers to manage the classroom and convey information. In the early days of school Internet use, classroom computers were used as a reward when pupils finished their class work. But, as educational programs were developed, many schools built Internet resources into the Curriculum. .

THE COST OF INTERNET USE IN SCHOOLS

Belem et al (2000) argue that ‘one outcome [of introducing the Internet in schools] is the cost of implementing the Internet as a learning tool and who will fund it’. In the age of Government cut backs, the possibility of introducing the Internet in every school seems unrealistic due to the high costs. It means that somehow funding must be available and this may mean that other areas in desperate need of Government funding may be affected. For example, priority funding may be taken from disadvantaged areas of society such as families on a low-income or people who are homeless to ensure that children have access to a computer in their classroom. Similarly, schools may need to plough more of their own funding into incorporating use of the Internet, which in turn would limit spending on other important areas of the curriculum.