British Journal of Visual Impairment

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British Journal of Visual Impairment 2007; 25; 32
DOI: 10.1177/0264619607071773

The online version of this article can be found at:
http://jvi.sagepub.com/cgi/content/abstract/25/1/32

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THE BRITISH JOURNAL OF VISUAL IMPAIRMENT

Vol 25(1): 32–50
DOI: 10. 1177/0264619607071773
ARTICLE

The role of the WHO ICF as a framework to interpret barriers and to inclusion: visually impaired people's views and experiences of personal computers

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ABSTRACT This article describes how the World Health Organisation's International Classification of Functioning, Disability, and Health (ICF), 2001, was used as a framework for the design of the interview schedule used in the Network 1000 project. It is argued that the ICF offers a vocabulary to enable visually impaired participants to describe their lives in terms of participation and potential barriers to social inclusion. The article presents interview data from 960 visually impaired people who were surveyed about their use of computers (amongst other things). Results show that computer use is clearly linked with age, with older visually impaired people far less likely to use computers. It is argued that, while technology may offer many benefits (including access to information and a route into employment), many visually impaired people do not see the relevance of ICT, perceive individually based barriers to the use of ICT (e.g. their visual impairment), and perceive socially based barriers to the use of ICT (e.g. cost, availability and accessibility of technology, and issues related to training). Importantly, it appears that different barriers may be more common amongst different groups.

KEY WORDS *computers, ICF, ICT, survey, method, technology, visual impairment*

INTRODUCTION

There has been, and still is, a considerable debate on the meaning of exclusion across the social sciences (Angus, 2005). Often the term is subsumed within issues of poverty, deprivation and disadvantage, all of

which are terms used interchangeably but signify that a group, or groups, of people are marginalized from full inclusion in mainstream society (Corcoran, 2003; Oppenheim, 1998).

It is useful to consider that the debate within disability studies has focused largely around conceptualizing this marginalization in three overlapping ways. Firstly, the debate has focused upon the discussion of the so-called medical and social models of disability. These models view exclusion of those with a disability from mainstream society as either on the grounds of physical difference or social difference whereby people with a disability are socially constructed as 'other' to those who are not (see, for example, Dear et al., 1997). Secondly, empirical research has focused upon the collection of evidence that identifies where and how people are being excluded either as a result of their impairment or social constructionism (see for example Hastings and Thomas, 2005; Murie and Musterd, 2004; Newman et al., 2005). Finally, the debate has focused upon the development of participatory research practices that seek to include people within the research process (see Duckett and Pratt, 2001, 2007; Kitchin, 2000; McClimens, 2004).

In crude terms, the first two aspects of this debate have highlighted that there are two lens' through which we formulate our views of social exclusion and disability: either by focusing on the impairment or on social barriers. What is missing is an approach that links these two conceptualizations together. One way of taking this conceptualization forward is to draw on the World Health Organization's International Classification of Functioning, Disability, and Health (ICF) (WHO, 2001). This new classification builds on the, somewhat contested, 1980 original classification (WHO, 1980) and modifies it by emphasizing an inclusive agenda and focusing on social participation, arguing in the process that this new classification has integrated these two differing approaches. Arguably this is reflected in its understanding of the interaction between the individual, social and environmental factors that combine to produce a unique outcome that is a feature of this interaction and not of the individual (Bornman, 2004).

However, the third aspect of the debate above argues that disabled people themselves should be at the centre of research and action. While this is an important and complex debate which is covered in greater detail elsewhere (see Duckett and Pratt, this issue), one key thrust is that the views and 'voice' of disabled people should be a central strand of empirical research. So, in rather simplistic terms, if we are interested in visually impaired people's experiences of why they may or may not be participating in some

social activity (e.g. using computers), then a crucial source of evidence is their views and opinions.

Using the ICF framework as a means of understanding and interpreting exclusion, this article seeks to explore this framework in the context of a national survey of visually impaired people, Network 1000. One aspect of the survey was the visually impaired people's use of and access to information technology, including the role of computers in reducing or presenting barriers to the wider social context.

Over the last twenty plus years there has been considerable research in this area and attention has focused primarily on the development and usability of technology (see, for example, Bozic and McCall, 1993; Douglas et al., 2001; Lancioni et al., 2004; Luxton, 1990; Vincent et al., 2003). Within this body of research there is implicit acknowledgement that access is a key issue; this relates both to usability and accessibility of technology (see Blenkhorn, 1994; Hale, 2000) and the importance of computer literacy in the wider social context of participation and access to education, employment and information (see Craven and Brophy, 2003; Douglas, 2001; Mather 1994; Papadopoulos and Goudiras, 2004).

Computer use and access to the Internet can play a significant role in overcoming exclusion by enhancing social networks as well as encouraging independence through personal access to information (Gerber, 2003). However, it is acknowledged that a digital divide exists that is not restricted to the 'haves and have nots' (Greater London Authority, 2003: 16); rather, other factors such as age, gender, disability and ethnicity are identified as core barriers to participation. This, combined with the current UK Government's recent Internet awareness raising initiative designed to overcome that 'digital divide' (Cabinet Office, 2002), suggests that research into understanding these barriers is both pertinent and timely.

NETWORK 1000

The broad project aim of Network 1000 is to generate information regarding the needs, circumstances, and opinions of people with a visual impairment in the UK. The current funding is scheduled to run for three years, ending in February 2007. More specifically, the project aims to:

develop and maintain a panel of 1000 participants;
collect longitudinal demographic data (information describing participants' characteristics and personal circumstances);
collect themed data (in depth information related to specific topics).

The advantage of a longer term approach to data collection is that the survey is in a position to report and record changes in circumstances over time, rather than recording data as a 'snapshot' in a single time frame as we are able to return to our participants for further data collection (see Corcoran et al., 2004 for a fuller account). The project is also underpinned by a commitment to consult with visually impaired people at every stage of the research process.

An important part of the survey was the sample design. This sampling process was carefully designed to generate a 'random sample' stratified and weighted for age. This means that the sample is statistically robust ('unbiased'), while still containing a range of people of different ages. The sampling means that the information gathered from the sample can be statistically generalized to the base population from which the sample was drawn (visually impaired people on the registers of blind and partially sighted people in England, Wales and Scotland – approximately 360,000 people). Importantly, we are seeking to identify and generalize the *range* of visually impaired people's views and circumstances and *not* to identify single typical views and circumstances (see Douglas, Corcoran and Pavey, in preparation).

In terms of survey content, a literature review and consultation with visually impaired people (though semi-structured interviews and focus groups) fed into the design of an interview schedule which covered a range of topics (see Corcoran et al., 2004), for example:

- *maintaining independence*. To understand access, in particular access to public transport;
- *assessing quality of life*. Understanding the need, provision and access to leisure and recreation activities. Understanding levels of and barriers to community participation;
- *identifying information needs and provision*. Understanding access to information including reading/writing format preferences. Evaluation of effectiveness and access to Information and Computer Technology (ICT)/Access Technology.

These themes reflect the centrality of our participants' personal experiences to the project and reflect the value that the project has placed on bringing 'real' voices from 'real' people in 'real' situations to the research table. However, pragmatically and particularly with a sample as large as this, collecting and analysing what would be essentially qualitative data from 1000 people is clearly problematic. In real terms this presents tension between maintaining the integrity of a project that has committed

itself to reporting these real voices and, in pragmatic terms, being able to analyse and collect large volumes of qualitative data.

However, although challenging this was not an insurmountable problem. The following section describes how we resolved this methodological conundrum through the use of the ICF in shaping the framework and vocabulary of the questionnaire, and we use the theme relating to ICT to illustrate this.

APPROACH

The ICF (WHO, 2001), which replaced the earlier WHO classification (WHO, 1980), was modified with a greater emphasis on developing an inclusive agenda and on social participation. In the process it attempts to integrate both the medical and social models of disability and as such recognizes the restrictions of impairment whilst simultaneously acknowledging the impact of social exclusion. It achieves this by adopting a number of key terms that captures elegantly these distinctions:

impairment – problems in body function or structure such as a significant deviation or loss.
activity – concerned with performances in activities at an individual level.
participation – concerned with involvement in life situations on a society level.
participation restrictions – problems an individual may experience in involvement in life situations.
environmental factors – concerned with variables which can be manipulated (whether physical, social, or attitudinal) which might improve performance on activities and/or increase participation.
barriers – general term describing environmental factors, which may cause 'activity limitations' and 'participation restrictions'. Similarly, '*Faciliators*' may remove such limitations or restrictions.

The introduction of this framework has excited considerable debate amongst those with an interest in its application. There are those who question whether this offers anything new (Bury, 2000; Pfeiffer, 2000) and those who consider that although flawed and possibly theoretically weak, it has some coherence and applicability (Hurst, 2000; Imrie, 2004). Despite this rather lukewarm reception by some, there are a number of researchers who are drawing on the framework within their current investigations (see for example: Crews and Campbell, 2001; Heerkens et al., 2004). Whatever the case, we believe the framework

Ask all participants:

1. How often do you use a computer? [ACTIVITY]

2. What do you use computers for? [ACTIVITY / PARTICIPATION]

3. Do you have access to a computer at home? Do you have access to a computer outside your home? [ACTIVITY / PARTICIPATION]

4. If you were able to, would you like to use a computer more often? [ACTIVITY]

Ask the participants who would like to use computers more often

4.1 What do you think would help you use computers more often? [BARRIERS / ENABLERS]

4.2 Put another way, what stops you from using computers more than you do now? [BARRIERS / ENABLERS]

Ask the participants who would not like to leave their home more often (or unsure)

4.3 Why do you say that? [BARRIERS / ENABLERS]

Figure 1. Example of question structure in relation to computer use, and links to ICF terminology in square brackets and capital letters. Answer categories and prompt / probe protocols not included.

offers a useful structure and vocabulary for examining the physical restrictions of impairment whilst simultaneously acknowledging the barriers that lead to social exclusion.

It was this vocabulary that enabled the project team to devise a way of capturing these voices but without generating unmanageable amounts of qualitative data. Further, this was within a framework that allowed the participant to express their own experiences (Douglas et al., in preparation). For example, we asked about a person's impairment – the nature and severity of their visual impairment; we asked about the level of activity – how often do you use computers; participation – what do

you use computers for; and barriers (or facilitiators) – what stops or what would help you use computers more. An example of the question structure is presented in Figure 1.

As well as providing the vocabulary, the way we are using the vocabulary does not force *causal* links between the concepts of impairment, activity and participation. Such causal links can come from the participants themselves should they perceive their position in this way. Indeed the analysis revealed there was a clear distinction between individual-based explanations and social based explanations of computer use, and this will be expanded upon in the results section.

In practice we believe the approach was extremely successful. Interviewers were made aware of what we were trying to achieve and were given careful training to ensure the question was correctly operationalized, for example when and how to prompt. Further, it maintained the centrality of our participant's experiences and 'real' situations while keeping the data collection and analysis manageable.

METHOD

Procedure and sample

The sample was drawn from the registers of blind and partially sighted people held by 20 social services departments in Great Britain. In total, 1007 participants were recruited by sending out approximately 6000 large print and audio information packs that invited people to take part in the project. This sampling process was designed carefully to generate a 'random sample' stratified and weighted for age. This means that the sample is statistically robust ('unbiased'), while still containing a range of people of different ages. The 1007 participants are split between five different age groups: 18–29 (n=201), 30–49 (n=211), 50–64 (n=224), 65–74 (n=185), and 75+ (n=186).

The sample is split between 960 visually impaired people who were interviewed directly and a further 47 people who had learning and communication difficulties and for whom our interview schedule was inappropriate. In these cases we carried out similar interviews with people who acted as a 'key informants' that is someone who was close to them and generally their main carer. All of the interviews provided extremely valuable data about the lives of visually impaired people, but in the most part the data is more usefully considered as two separate sub-groups (n=960 visually impaired people and n=47 key informants). For the purposes of this article, we describe the responses from the 960 visually impaired people who took part in an interview directly.

Each recruited participant took part in a telephone interview between the Spring of 2005 and the Spring of 2006. Each interview took an average of 40 minutes and covered a broad range of topics, one of which was ICT. In most cases, the figures presented have been weighted to aid generalization to the population. The weightings are differentially applied to the different age groups to account for the known age profile of the population.

Sample characteristics (weighted)

A detailed account of the survey results can be found in the main project report (Douglas et al., 2006), but some general figures are presented here to provide context. As expected (reflecting the registers from which our participants were recruited), there were more women than men (56% compared with 44%), and an approximately equal split between those registered blind (46%) and those registered partially sighted (52%). It is interesting to note that a number of people did not know their registration status or were not aware they were registered at all (2%).

Many of the visually impaired people we interviewed reported that they had additional health problems and/or disabilities other than their visual impairment, almost three quarters (70%) of the visually impaired population. The likelihood of this increased by age, with 73% of those aged 65 and upwards reporting additional health problems or disabilities compared with 44% in age groups 18–29 and 46% for those aged 30–49. This did not appear to be linked to registration status. Those who said they had additional health problems or disabilities other than their visual impairment were asked to describe them, and some of the conditions are clearly linked with age as would be expected (e.g. heart problems and arthritis).

In terms of marital status, the two biggest groups were those who were married (39%) and widowed (42%). Marital status is closely linked with age; while we estimate that 42% of the visually impaired population were widowed, many of these were in the older age groups. Similarly, people who were single and never married tended to be younger. In terms of household makeup, an estimated 45% of visually impaired people lived alone. Again this is closely linked with age, being more common amongst older people.

When asked to describe their employment status, the majority of people (80%) described themselves as retired from paid work altogether. This is not surprising considering the age characteristics of the population. More

Table 1. How often do you use a computer?

	Age group			
	Working age %	Retirement age%	Total weighted%	Total sample (n)
Every day	38	4	10	(257)
Several times a week	14	3	5	(101)
At least once a week	6	2	3	(53)
At least once a fortnight	1	1	1	(12)
At least once a month	2	0	0	(14)
Less than once a month	3	0	1	(26)
Don't use / never use	32	88	77	(471)
Not since onset of VI	2	2	2	(17)
Use with someone else	0	0	0	(2)
Other	1	0	1	(5)
Number interviewed	(561)	(397)	–	(958)

Base: whole sample (N = 958), weighted

relevant is the employment status of people of working age; 33% described themselves as being employed, self-employed, or employed and a student. 20% of those of working age described themselves as unemployed, 22% long term sick or disabled, 7% as looking after family, and 7% as being retired from paid work altogether (most of whom were aged 50 or over). As will be seen, age is closely linked with visually impaired people's reported computer use. Splitting people into working and retirement age groups provides a useful and relatively easy way of presenting this, while also capturing the link between computer use and employment.

RESULTS

1. Computer Use – activities and participation

A high proportion of the sample appeared to be split between those who used computers often and those who did not use them at all. This was clearly linked to age – younger participants were more likely to use computers than older participants. The resultant weighted frequencies reflect this – an estimated 77% of the population never used a computer (88% of those of retirement age, 32% of those of working age). The use of computers did not appear to be linked to registration type (see Table 1).

Table 2. What do you use computers for?

	Age group			
	Working age %	Retirement age %	Total weighted %	Total sample (n)
Word processing (e.g. writing letters)	80	63	73	(376)
Sending and receiving emails	73	45	62	(347)
Surfing the World Wide Web / Internet	75	33	58	(345)
Spreadsheet work	41	13	30	(177)
Database work	35	20	29	(156)
Anything else – including:	32	46	38	(165)
Games / leisure / photography (n)	(53)	(16)	–	(69)
Number interviewed	(402)	(71)	–	(473)

Base: Those who use computers (N = 473), weighted

Word processing, emailing, and use of the Internet were the most common uses of computers. Browsing the Internet and emailing was more common amongst the younger age groups (see Table 2).

The majority of people aged 18–29 and 30–49 had a computer at home (82% and 77%, respectively). This figure decreased with age (22% in the 75+ age group). Similarly more people in the younger age groups had access to a computer outside the home.

2. Participant explanations: 'enablers' and 'barriers'

When we asked participants 'would you like to use computers more than you do currently?', n = 347 said yes (an estimated 34% of the population). Of the people who said they do not use a computer at all (an estimated 77% of people with a visual impairment, predominantly people aged 50+), 29% wanted to use computers. Those who said they would like to use computers more were asked 'What would help you use computers more?' and 'Put another way, what stops you from using computers more than you do now?' This generated many ideas about perceived barriers and enablers to people using computers more than

Table 3. What stops and helps you using a computer (more often)

	Age group			
	Working age %	Retirement age %	Total weighted%	Total sample (n)
Individual-based explanations				
Problem related to visual impairment	30	48	43	(125)
Confidence	8	9	9	(28)
Time and priority/ motivation	9	6	7	(37)
Social-based explanations				
Cost of equipment	18	14	15	(62)
Availability of equipment	21	21	21	(78)
Accessibility of equipment	39	22	26	(132)
Issues relating to course	14	9	10	(45)
Don't know	6	10	9	(34)
Number interviewed	(238)	(140)	–	(378)

Base: Those who would like to use computers more than they do currently (N = 378), weighted

they did currently. When these responses were collapsed and combined, some interesting individual, social and economic factors emerged. As would be expected, these are linked to age.

Visual impairment was identified as a key barrier by many (43%), and this was more common amongst those of retirement age compared with working age (48% and 30%, respectively). A more social explanation related to the accessibility of the equipment (e.g. inaccessible screen or keyboard) was also seen as a key barrier (26%). In contrast, this perception was more common amongst people of working age than those of retirement age (39% and 22%, respectively). These contrasting findings suggest that social explanations of disability (in relation to computer use at least) are more common amongst younger than older people with a visual impairment (see Table 3).

Nevertheless, there are other social and individual explanations which do not appear to be age related. For example, lack of confidence (9%), time and motivation (7%), the cost of equipment (e.g. specialist equipment and installation and use of Internet connections) (15%), and general issues related to training and courses (e.g. cost and availability) (10%). The general availability of equipment (both specialist and generic) was seen as a barrier by many (21%).

Those who said they would *not* like to use computers more (or did not know) were asked 'Why do you say that?' Again, this generated many explanations. Age was seen as a key barrier by many (14%), not surprizingly these were almost entirely people of retirement age. Again, visual impairment was identified as a key barrier by many (20%), and this was more common amongst those of retirement age compared with those of working age (21% and 12%, respectively). People of working age often felt they used computers enough already and therefore did not want to use them more (52% for this age group, 11% of visually impaired people in total).

The most common explanation given for not wishing to use computers more was that people were simply not interested (43%), and this was particularly common amongst those of retirement age (47%).

3. Patterns in the data

As already noted, the sample was broadly split between those who used computers often (at least once a week) and those who rarely or never used computers. This was clearly linked to age – younger participants were more likely to use computers often than older participants. Table 4 presents the distribution of participants who are of retirement and working age and who are 'computer users' (at least once per week) or 'rare computer users' (less than once a week). These categories are cross-tabulated with responses to the question 'Would you like to use computers more than you do currently?'

Table 4 clearly illustrates a difference between the working and retirement age groups. The rare computer users amongst the working age group were more likely to say that they wanted to use computers more often than other groups (78%). Contrast this with only 28% of the retirement age group who wanted to use computers more often. Perhaps the clearest observation, however, is that the biggest group by far (in terms of population) was the rare computer users in the retirement age group.

In the following analyses we first talk about people of working age and then people of retirement age.

Table 4. Would you like to use computers more than you do currently?

	Would you like to use computers more?					
	Yes	No	Unsure	Other**	Total weighted	Total (n)
Working age						
Computer user	37%	61%	2%	0%	12%	(353)
Rare computer user	78%	22%	0%	0%	8%	(194)
Retirement age						
Computer user	52%	35%	10%	3%	7%	(58)
Rare computer user	28%	65%	6%	1%	73%	(328)
Total weighted %	34%	65%	6%	1%	100	–
Number interviewed	(365)	(512)	(44)	(12)		(933)

Cross-tabulated with age group (working / retirement age) and computer use.
Base: Those who knew how often they used the computer (N = 933)*, weighted
*Excluding those who were unclear about how often they used a computer
**Including: 'Don't know'; 'Ought to'

People of working age

Unsurprisingly, even *within* the working age category those who used computers tended to be younger than those who rarely used computers (weighted mean of 43 years old compared with 50 years old; $F = 15.8$, df 1183, $p < 0.0005$). There is a similar significant link with age of onset of visual impairment (age of onset tends to be younger amongst those who use computers), although this variable is confounded with age (younger people tending to have an earlier onset of visual impairment). There appears to be no significant link with sex or level of vision.

The computer user group tended to have much greater access to computers compared to rare computer users (92% compared to 45% having a computer at home). Computer users are more likely to be in employment than rare computer users (47% and 15%, respectively). It is likely that this reflects the fact that many jobs involve working with computers, but may also reveal that experience of using computers may lead to employment.

The majority of the computer users who did not want to use computers more said that they used them enough already, and very rarely did these

people identify barriers. This compares to rare computer users who more often said they were not interested (over 40% of people), but also more frequently identified other barriers such as their visual impairment and accessibility of the equipment.

For those who did want to use computers more often, the differences were less obvious. The computer users were less likely to identify their visual impairment as a barrier (24% compared with 34% for rare computer users). Also, rare computer users were more likely to see accessibility of equipment as a barrier to using computers more often.

People of retirement age

As with working age people, even within the retirement age category computer users tended to be younger than rare computer users (weighted mean of 78 years old compared with 81 years old; $F=16.3$, df 1747, $p<0.0005$). Similarly, the computer users group had much greater access to computers compared to rare computer users (81% compared to 20% having a computer at home). Nevertheless, beyond this, the retirement age group are quite different to the working age group.

In terms of those who wanted to use computers more, visual impairment was cited as the most common barrier (39% and 50% for computer users and rare computer users, respectively). However, social explanations related to the availability and accessibility of equipment was also relatively commonly cited (particularly by computer users).

In terms of those who did not want to use computers more, the majority of computer users said they used them enough already, and rarely identified barriers. This compares to rare computer users who most commonly said they were not interested (49%), but also commonly cited individually based barriers related to their old age and their visual impairment. The identification of social barriers was very rare in this group (the biggest group in terms of numbers in the population) – only accessibility of equipment was cited by any significant number (and even then only 9%).

DISCUSSION AND CONCLUSIONS

In the discussion we first reflect upon the method adopted in Network 1000, and then turn our attention to the findings in relation to the use of computers by visually impaired people.

In terms of the method, the research has generated a variety of information in relation to a participant's perception of their impairment, activity,

and participation. The data presented here focuses upon activity and participation in relation to computer use. Perhaps a more fundamental and ambitious aim was to gain an insight into disabled people's own opinions and explanations of their situation. The data offers clues as to the array of perceived barriers faced by visually impaired people. Significantly, these are often related to apparent individually based explanations (often related to a persons visual impairment, but also other health conditions and age as well as more psychological constructs such as confidence), and also socially based explanations (such as availability and accessibility of computer software and hardware). To this extent the method is successful because the barriers and enablers which people identified are in response to relatively value-free prompts ('What would help you use computers more?'; 'Put another way, what stops you using computers more?'; and 'Why do you say that?'). Therefore, we would argue the responses give a greater sense of what visually impaired people themselves think about their situation, and to some extent how different people and sub-groups might interpret their situation in different ways.

In terms of the use of computers by visually impaired people, the findings offer an insight into the amount that computers are used by visually impaired people and the broad types of activity in which they are engaged. The most clear finding is that the vast majority of people of retirement age never use computers and are effectively excluded from any benefits they might afford (whether by their own choosing or for other reasons). While people of working age are more likely to use computers, there are still many who never use them. In exploring our understanding of how these findings might be linked to social inclusion and exclusion of visually impaired people, we need to consider what are the apparent barriers and enablers to people engaging in real purposeful use of computers are. We consider the following in turn:

- identifying purpose and motivation;
- recognizing and overcoming 'individual barriers'; and
- recognizing and overcoming 'social barriers'.

Identifying purpose and motivation

Many people simply did not want to (and presumably saw no purpose) to using a computer. These were very often older people. It might be tempting to simply accept this and think no more about it. However, a potential danger is that by not engaging with technology people are excluded from the opportunities and services it affords which may be mainstream (e.g. Internet shopping and associated cost savings) or specific

to visually impaired people (e.g. enlarged magnified backlit text, speech supported reading). A key first step to using ICT is to understand the potential benefits it provides. Including visually impaired people (particularly those who are older) in this understanding appears to be a key challenge.

Recognizing and overcoming 'individual barriers'

Visually impaired people who did not use computers often identified individually based barriers, e.g. old age, visual impairment. It may be that many visually impaired people (and, most likely, many sighted people) assume that visual impairment means that using a computer is impossible. While this is not the case, the very perception that it is impossible (or it is so difficult or complex that it might as well be) may mean that visually impaired people disengage from the possibility and again are effectively excluded from the potential benefits this technology brings.

Recognizing and overcoming 'social barriers'

Visually impaired people who did not use computers often identified socially based barriers, e.g. cost, availability and accessibility of equipment, availability of training. To some extent these perceived barriers have more tangible (though not necessarily easily realized) solutions. We must strive to develop better and affordable access technology, continue to challenge mainstream software developers and web designers to ensure that their products are optimally designed, and we must provide more high quality training to visually impaired people wanting to use computers.

The analysis presented in this article leads us to identify three broad barriers to using computers by visually impaired people, and therefore barriers to the benefits it offers (ranging from access to information, means of communication, and greater opportunities for employment). Importantly, it appears that different barriers may be more common amongst different groups.

Acknowledgements

We would like to thank all of the participants who have taken part in this research including the key informants who have enabled the voices of those unable to participate directly, to be included in the survey. Thanks also to our research partners, VISION 2020 UK, and our funders, the Big Lottery Fund.

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