

A scoping study assessing the relationship between disability and health and safety

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Emma Wilde
Victoria Bennett
Roxane L Gervais

Health and Safety Laboratory
Harpur Hill
Buxton
Derbyshire
SK17 9JN

The Health and Safety Executive (HSE) wishes to gain an understanding of the current research that is available in the area of health and safety and disability to establish any additional areas on which it should focus as an organisation. To meet this requirement the Health and Safety Laboratory (HSL) carried out a scoping study to examine the research undertaken on disability and health and safety at work, and to highlight any gaps in the research. The scoping study considers whether individuals with disabilities are correctly provided for at work, whether they have the necessary access to the workplace, and the health and safety challenges that they may face on a daily basis.

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EXECUTIVE SUMMARY

Background

The Health & Safety Executive (HSE) wishes to gain an understanding of the current research that is available in the area of health and safety and disability to establish any additional areas on which it should focus as an organisation. To meet this requirement the Health & Safety Laboratory (HSL) carried out a scoping study to examine the research undertaken on disability and health and safety at work, and to highlight any gaps in the research. The scoping study considers whether individuals with disabilities are correctly provided for at work, whether they have the necessary access to the workplace, and the health and safety challenges that they may face on a daily basis.

Objectives

The main objective of this scoping study is to identify the research that is currently available on health and safety at work, in order to establish whether there is more employers could be doing to ensure the inclusion of disabled individuals into the workplace.

Method

The authors used desktop research to generate a core quantity of secondary studies, articles and legislation. These data were then read, interpreted and assessed for the present report.

Main Findings

- There are many options available to employers to ensure that employees with disabilities are able to carry out their work in a safe and healthy way, while still complying with health and safety laws and regulations.
- As disabilities can range from asthma, chronic fatigue syndrome, arthritis, cerebral palsy and epilepsy, these different types of disability may require different accommodations or adjustments in the workplace. Therefore employers and employees must work together in order to ensure that the most suitable changes are made to ensure that employees with disabilities are included in the work place.
- Employees with disabilities do not pose a greater safety risk than able-bodied employees and have better or similar safety records.
- Employees with disabilities are the experts in determining what is best for them in coping with their disability, and also what is required for them to function effectively within an organisation.
- While there is research to show the importance of evacuation for employees with disabilities, the practical aspects of implementing plans are not as strong. Overall, employers need to devote more time and effort in developing emergency evaluation plans that comprehensively include individuals with disabilities.
- Assistive technologies (AT) can act as an aid and thereby accommodate employees with disabilities in carrying out their work. Other types of aid mechanisms or accommodations include ergonomic interventions available for promoting an inclusive work design and safety for workers, and also for creating good working conditions, all of which will in turn increase human performance.

- Social stigma remains still the main barrier to facilitating the full employment of people with disabilities. Research has shown, for example, that employers retain the stereotype that individuals with mental illness are unable to function in many types of work.
- Companies need to improve accessibility to and within their premises in order to facilitate better work conditions, particularly in terms of work design and safety for workers. These changes would increase performance among employees with disabilities.

Recommendations

In response to the findings from the scoping study, the following recommendations are proposed.

1. There is a need to obtain more evidence of the prevalence of different disabilities and disorders. This would enable organisations to have available to them more specific information that would allow them then, to understand and identify with employees with disabilities about those resources that they require to function most effectively at the workplace.
2. It would be beneficial for organisations to know about the types of adjustments/interventions that have been implemented within workplaces place and also of their effectiveness. It would be important also to consider by the size of organisation (e.g. large or small) the use of these adjustments/interventions. In building this evidence the opinions and perceptions that those adjustments made on employees with disabilities, as well as of the employers, should be obtained.
3. Due to the high level of unemployment of individuals with disabilities, more exploratory research is needed to identify **if** and **why** individuals with disabilities are failing to find and retain employment and also **if** and **why** employers are failing to accommodate the needs of the worker with a disability. Although the employment of individuals is outside the remit of the HSE, if the research shows that employers perceive there is a lack of necessary guidance and support, the HSE could look to fill that gap. This could be done either by more intensive promotion of the information that is available (<http://www.hse.gov.uk/disability/index.htm>), or by devising any new guidance that may be needed. The research may identify, for example, that education is needed on the nature of accommodations for employees with disabilities and how to implement them. It might also be useful for employers to have access to information on individual disabilities, and their strengths and weaknesses. A centralised location in which such information is housed would allow employers to access this service, which would help inform decisions on suitable accommodations. A campaign highlighting this information may encourage uptake in this area.
4. The research discussed suggests that greater use should be made of supported employment programmes, as they appear to be effective. However their use is not widespread. More research therefore may be needed to establish how and why they are effective.
5. While the current research in this area indicates that accommodations for physical disabilities are becoming more widespread, the same is not true for mental disabilities. Therefore, more support may be needed for employers trying to accommodate those employees with mental disabilities.
6. Evidence suggested that organisations are not doing enough to ensure that employees with disabilities are included in emergency evacuation plans. It may be necessary to

conduct further research in the United Kingdom (UK) to determine the extent to which employers are able to accommodate the needs of disabled individuals in respect of evacuation policies and whether more input is needed from the government to ensure organisations develop appropriate evacuation plans.

7. Further interventions in the workplace could look to adopt a holistic approach to accommodating workers with disabilities by removing both the physical and social barriers. The HSE could first identify and carry out research that examines if there are interventions of this kind currently in use and ascertain their effectiveness.
8. It is clear that employers' stereotypical attitudes towards workers with disabilities are still prevalent in UK workplaces and remain the biggest barrier to full employment. It therefore follows that more needs to be done to reduce the problem. Further work in this area is needed via the use of a campaign to increase knowledge and understanding or provide further guidance and support to employers in order that they feel more confident in their ability to accommodate workers with disabilities.

1 INTRODUCTION

1.1 BACKGROUND

The Health & Safety Executive (HSE) wishes to gain an understanding of the current research that is available in the area of health and safety and disability to establish any additional areas on which it should focus. To meet this requirement the Health & Safety Laboratory (HSL) carried out a scoping study to examine the research undertaken on disability and health and safety at work, and highlight any gaps in the research. The scoping study considers whether individuals with disabilities are correctly provided for at work, whether they have the necessary access to the workplace, and the health and safety challenges that they may face on a daily basis.

1.2 OBJECTIVES

The main objective of this scoping study is to identify the research that is currently available on disabilities and health and safety at work, in order to establish whether there is more that employers could be doing to ensure the inclusion of disabled individuals into the workplace.

1.3 DEFINITION OF DISABILITY

Disability is not restricted to one concept or understanding as it is multi-faceted. Consequently, various definitions have emerged and four of these are presented below.

1.

“A lasting physical or mental impairment that significantly interferes with an individual’s ability to function in one or more central life activities, such as self-care, ambulation, communication, social interaction, sexual expression, or employment. For example, an individual who cannot see has visual disability”. (American Psychological Association (APA), 2007, p. 285)

2.

“1) A physical or mental condition that limits a person’s movements, senses, or activities. 2) A disadvantage or handicap, especially one imposed or recognized by the law”. (Oxford University Press, 2002, p.406)

3.

“A physical or mental impairment, which has a substantial and long-term adverse effect on his (a person’s) ability to carry out normal day-to-day activities.” (Disability Discrimination Act (DDA), 1995)

4.

“Disabling conditions are diverse in their causes, nature, timing, pace, and societal implications. Some are congenital, others acquired. Some occur suddenly, with injury or accident; others arise slowly, with progressive debility. Some gradually limit but do not threaten life; others hurry death. Some are visible to outsiders; others remain hidden. Some engender stigmatization and blame; others prompt pity and paternalism. Some are seen primarily as ‘diseases’ (e.g. cancer, emphysema), even when profoundly disabling. Unlike gender, race, and ethnicity - virtually immutable traits - anyone can become disabled.” (Steinberg, Iezzoni, Conill and Stineman, 2002, p. 3148)

In the United Kingdom’s (UK) Disability Discrimination Act (DDA), the definition of “*normal day-to-day activities*” refer to anything that people do on a regular basis, such as reading, writing, using the telephone, having a conversation and travelling by public transport. The phrase “*long term*” indicates that the impairment should have lasted or can be expected to last at least a year. The word “*substantial*” denotes something that is not minor or trivial (<http://www.hse.gov.uk/disability/law.htm>).

The present report contains the following sections. Section two provides the method used in the study, section three presents the impact and context of disability as it pertains to the present research, section four outlines the review of the literature, section five offers the conclusions and section six the recommendations.

2 METHOD

In a scoping study, it is essential to search for all relevant studies regardless of their design, in order to ensure inclusiveness. Consequently, strict limitations were not placed on the search terms (Arksey and O'Malley, 2005, Loveman and Gabarro, 1991).

However, due to the previous research and work carried out by the HSE, the following search criteria were not included in the first search:

- Risk assessments for people with disabilities
- Issues around communication
- Examples of employers using disability/risk assessments as an excuse not to hire individuals.

The authors jointly compiled appropriate search terms to elicit as much relevant information as possible. The list of terms included words and phrases relating to the disability of an individual (disability, disabled, disab*), terms relating to the workplace (work, workplace, work environment) and terms relating to health and safety, which included relevant equipment (health and safety, ramps, accessibility, ease of working, personal protective equipment, respiratory protective equipment, wheelchairs, occupational health).

At the request of the HSE, the search also included the terms of sexual orientation and disability, but only limited material, that was only slightly relevant, was retrieved. This is discussed in a separate section in the present report.

These search terms were given to the HSE's Information Management Unit's search team together with an overview on the topic's background. A date limit of 10 years was applied initially. This search identified a wide range of research articles.

They provided a list of abstracts from several databases. These are outlined below:

- Oshupdate: 23 references
- Healsafe: 2 references
- Medline, Embase and Psycinfo: 23 references
- Web of Science: 125 references
- Applied Social Sciences Index and Abstracts: 19 references
- Ergonomics Abstracts: 91 references
- HSELINE, CISDOC, RILOSH, NIOSHTIC, OSHLINE: 113 references

The abstracts of the 396 articles were briefly reviewed for their relevance, and many articles were eliminated at this stage. The authors identified 100 articles that appeared to be the most relevant, and these were ordered in full. The HSL's Information Centre was unable to obtain copies of nine of the requested articles.

3 THE IMPACT AND CONTEXT OF DISABILITY

3.1 EMPLOYMENT STATISTICS

Statistics is available on the employment status of individuals with a disability in the workplace. For example, Gates (2001) outlined information gained from Mencap at the June 2000 launch of a campaign emphasising the then situation with respect to employment of people with learning disabilities:

- 6.5 million individuals with disabilities **of working age** live in the UK (19 per cent of the working age population).
- 12 per cent of that 6.5 million **are employed**.
- 58 per cent of individuals with disabilities in work **earn less than £10,000** and, on average, earn 10 per cent less than employees without disabilities.
- 2.6 million are out of work and **receiving governmental social assistance** (on benefits).
- The employment service hoped to place **85,000 unemployed individuals with disabilities** into work during 1999-2000.

Unfortunately, the data that were available in 2007 do not show a marked increase in the number of disabled individuals who are employed at the present time. According to the UK's Office for National Statistics' *Labour Force Survey*, Sept - Dec 2006. These data pertain to people of working age only.¹

- Nearly **one in five** people of working age (6.9 million, or 19%) in Great Britain are disabled.
- Only about **half of individuals with disabilities of working age are in work** (50%), compared with 80 per cent of individuals without disabilities of working age.
- Almost half (45%) of the disabled population of working age in Britain are **economically inactive** i.e. outside of the labour force. Only 16 per cent of non-disabled people of working age are economically inactive.
- There are currently **1.2 million individuals with disabilities** in the UK who are available for and want to work.
- Employment rates vary greatly according to the **type of impairment** a person has. Disabled people with **mental health problems** have the lowest employment rates of all impairment categories at only 21 per cent. The employment rate for people with learning disabilities is 26 per cent.
- Individuals with disabilities are more than twice as likely as those individuals without disabilities to have **no qualifications** (26% as opposed to 10%).
- The average gross hourly pay for employees with disabilities is **£10.31 compared to £11.39** for those employees without disabilities.

¹ <http://www.shaw-trust.org.uk/page/6/89/>

The context of these data is highlighted further in the table that follows.

Table 1: Employment figures comparing non-disabled to disabled individuals²

| | Non-disabled people | Disabled people |
|--|----------------------------|------------------------|
| Total | 29,710,306 | 6,941,935 |
| In employment | 23,871,969 | 3,450,982 |
| ILO unemployed | 1,257,765 | 332,437 |
| Economically inactive | 4,580,572 | 3,158,516 |
| Economically inactive who 'would like to work' | 1,118,308 | 906,424 |

Table 1 shows that although individuals with disabilities of working age constitute 19 per cent of the population, the number of persons who are economically inactive is similar to that of the non-disabled population, i.e. 3,158,516 to 4,580,572. Further, those who are disabled and would like to work ($N = 906,424$) are fairly similar in number to those who are not disabled and would like to work ($N = 1,118,308$). These figures reflect the interest of disabled individuals in being involved in the workplace.

However, from the data provided in Table 2, disabled individuals are more likely to be employed if they are diabetic, experience chest/breathing problems or allergies than if they have speech impediments, learning difficulties or experience mental illnesses or phobias.

² *ibid* - Labour Force Survey: The LFS is the largest regular household survey in the UK. In any three month period. Interviews are carried out continuously throughout the year and results are published monthly or quarterly.

ILO unemployed: The International Labour Organisation's definition of unemployment covers people who are: out of work, want a job, have actively sought work in the previous four weeks and are available to start work within the next fortnight; or out of work and have accepted a job that they are waiting to start in the next fortnight.

Available for and want to work: This includes those who are ILO unemployed and those who are economically inactive and would like to work. The percentage totals are a % of the inactive population, not the total working age population.

Table 2: Employment figures by impairment³

| Main impairment | % in employment |
|--|------------------------|
| Diabetes | 67.0 |
| Difficulty in hearing | 59.0 |
| Skin conditions, allergies | 63.3 |
| Chest/breathing problems | 62.8 |
| Heart, blood pressure/circulation problems | 58.7 |
| Difficulty in seeing | 48.5 |
| Stomach, liver, kidney or digestive problems | 59.7 |
| Other health problems or disabilities | 53.5 |
| Arms or hands | 52.0 |
| Back or neck | 48.7 |
| Legs or feet | 45.4 |
| Epilepsy | 43.6 |
| Speech impediment | 19.2 |
| Progressive illness not included elsewhere | 42.1 |
| Learning difficulties | 25.7 |
| Depression, bad nerves or anxiety | 25.8 |
| Mental illness, phobias, panics or other nervous disorders | 13.3 |

3.2 TAKING ACCOUNT OF DISABILITY

The UK's Disability Discrimination Act came into effect in December 1995 and brought in measures to prevent discrimination against individuals with disabilities. The DDA applies to all organisations regardless of industry or sector. The DDA's definition of disability covers individuals with diverse medical conditions inclusive of asthma, chronic fatigue syndrome and depression as well as more obvious conditions such as arthritis, cerebral palsy, epilepsy and diabetes. Disability is, therefore, not always obvious.

With nine million people in the UK defined as disabled (DDA, 1995), businesses are becoming increasingly interested in the issue of accessibility for people with disabilities for three main reasons: ethics, law and economics. Bagshaw (2004) highlighted that a 1994 United States of America (USA) study found that the average annualised return for the top 100 companies in diversity management was 18.3 per cent, when compared to 7.9 per cent for the 100 companies

³ *Ibid*

rated the lowest. This illustrates that there is a strong business case for the inclusion of this group (as well as other diverse groups) within organisations. Further, it has been noted that individuals with disabilities may be more likely to seek employment in businesses that ensure that they are able to access services comfortably and easily (Robertson, 2003).

In the specific context of health and safety, Lester and Caudill (1987) refuted the assumption that workers with disabilities may prove a greater safety risk within the workplace. They cited research to show that from a survey of 3000 firms in the USA, that there was no quantifiable effect on the insurance premiums of 90 per cent of these firms as a result of them employing disabled individuals. In addition, they noted that 98 per cent of employees with disabilities have safety records that are better or similar to employees without disabilities, with only two per cent of employees with disabilities having worse records.

The DDA is very detailed, consisting of eight 'Parts' and eight 'Schedules'. These Parts and Schedules provide guidance to employers and service goods providers, with an aim to preventing discrimination against individuals with disabilities. Peebles (2005) reviews the DDA, from which the following information is drawn. Part one of the DDA provides a definition of disability as illustrated. Part two is of most relevance to employers and intends to prevent discrimination against employees by ensuring that employees with disabilities are able to carry out their work without a substantial disadvantage. Under Part two, it is stipulated that, "*employers should not discriminate against disabled people*". They must not treat them less favourably than a non-disabled person and reasonable adjustments should be made to prevent discrimination. The Act makes clear that, "*the duty of provision of a reasonable adjustment is triggered when a disabled individual applies for a job, is employed or when it becomes apparent that an existing employee requires some form of accommodation adjustment. Reasonable adjustments may comprise changes to either physical features or arrangements*". Robertson (2003) notes some typical changes that employers could make, including adjustments to premises, reallocation of duties, changes to working hours, assigning the person to a different place of work, acquiring special equipment or modifying existing equipment, modifying procedures for testing or assessment, providing a reader or interpreter and providing supervision. This suggests that employers must consider the needs of individuals with disabilities throughout the entire employment process, from the point of recruitment through to their exit from the organisation.

Part three of the DDA aims to ensure that individuals with disabilities have equal access to products and services. As such, service providers should make reasonable adjustments to their premises to ensure the services they provide are accessible and do not discriminate against those with a disability. They may have to change practices, policies and procedures, provide auxiliary aids and services, and provide reasonable alternative methods of making its services available. Physical features include anything on the premises arising from a building's design or construction or from an approach to, exit from or access to such a building: fixtures, fittings, furnishings, furniture, equipment or materials and any other physical element or quality of land in the premises (Peebles, 2005).

The DDA was revised in 2005 and builds on and extends the legislation that was stipulated in 1995. The DDA 2005 introduced a duty on all public bodies to promote equality of opportunity for individuals with disabilities. Therefore, this entailed them taking account of the needs of employees with disabilities as an integral part of their policies, practices and procedures, and includes the need to eliminate unlawful discrimination and disability related harassment, promote equality of opportunity and positive attitudes to individuals with disabilities and encourage individuals with disabilities to participate in public life (Provisions of the DDA, 2005).

In addition to the DDA, the UK government established *The Equality and Human Rights Commission* in 2007. The key aim of the commission is to “end discrimination and harassment of people because of their disability, age, religion or belief, race, gender, or sexual orientation.”⁴ Further, the UK is bound by the *United Nations (UN) Convention on the Rights of Persons with Disabilities*, which it ratified on 30 March 2007⁵, and by the European Union *Employment Equality Directive 2000/78/EC*.⁶

3.3 BALANCING DISABILITY RIGHTS AND HEALTH AND SAFETY

From a health and safety perspective, as it pertains to the working environment, there is a series of issues to be considered, including, whether an individual has the physical/mental capacity to carry out work without putting him/herself and others at risk. Reasonable adaptations to the work and workplace, if any, are required to facilitate the employee working safely, inclusive of the pre-existing risk assessments and controls and the associated health and safety matters, such as exiting in the event of an emergency.

Employers have a duty to make reasonable adjustments under the DDA and in addition must meet duties under the Health and Safety at Work (HSAW) Act (1974). Under this Act, the main duty is to ensure so far as is reasonably practicable, the health, safety and welfare of all employees. Employees also have a duty to take care of their own health and safety and that of others who may be affected by their acts or omissions (Davies, 2001). The HSAW Act (1974) is supplemented by other regulations, including The Management of Health and Safety at Work Regulations 1999. These regulations require employers to make a ‘suitable and sufficient’ risk assessment of health and safety risks and to identify groups of employees (e.g. workers with disabilities) that are particularly vulnerable to health and safety risks.

If an employee with a disability faces a higher risk because of a disability, the employer must take steps to prevent that risk wherever it is reasonably practicable. Those steps should include adjusting working conditions, as implementing reasonable adjustments should eliminate health and safety risks. If residual risk remains then the employer must satisfy the DDA’s criteria for justification to avoid discrimination. Under the DDA, an employer has a duty to balance the interests of employees with disabilities with those of other employees and members of the wider public.

Tearle (2001) noted that the principles of health and safety management are the same whether the individual is disabled or not. The DDA, therefore, does not require an employer to make any adjustment or to do anything that would result in a breach of health and safety or fire regulations. However, blanket exclusions of people on the grounds of health and safety are not permitted. Tearle (2001) also suggests that a good health and safety culture can underpin all that is required in complying with the DDA by:

- Planning
 - Adopting a systematic approach to the risk assessment
- Organisation

⁴ http://www.direct.gov.uk/en/DisabledPeople/RightsAndObligations/DisabilityRights/DG_10023457

⁵ http://www.direct.gov.uk/en/DisabledPeople/RightsAndObligations/DisabilityRights/DG_10026938

⁶ http://ec.europa.eu/employment_social/news/2001/jul/directive78ec_en.pdf

- e.g. effective communication among managers and between managers and other staff
- Control
 - Ensuring everyone knows his/her responsibilities
- Monitoring and reviewing performance within the organisation in observing the letter and the spirit of DDA.

With the ageing of the workforce in the UK, there is increasing pressure to rehabilitate people to re-enter the workforce. If there is a management system in place that can effectively deal with colleagues who fall under the DDA, then an organisation will also be much more able to manage the range of physical and mental abilities that any employee may have at any one time throughout his or her working life (Waterman, 2005).

4 REVIEW OF THE LITERATURE

4.1 STUDY LIMITATIONS

While an extensive search of the literature was conducted on the topic of health and safety and disability, there are still some limitations. The search does not include research on return to work or gaining employment for individuals with disabilities, as the review focuses specifically on how employees with disabilities are able to adhere to health and safety requirements. Further, in order to make the search as wide as possible, research from both within and outside the UK was included. As such, the reader should be aware that laws and legislations vary across different countries. These are highlighted at appropriate times throughout the report.

4.2 THE STRUCTURE OF THE REVIEW

The present review places the findings in the framework of the three interacting factors that influence individual's health and safety related behaviour (HSG48 - HSE, 1999), regardless of disability. These are *the job, the individual* and *the organisation*.

As indicated by HSG48, p. 2:

Within the Job - i.e. task and working environment: *“Tasks should be designed in accordance with ergonomic principles to take into account limitations in human performance. Matching the job to the person will ensure that they are not overloaded and that the most effective contribution to the business results. Physical match includes the design of the whole workplace and working environment. Mental match involves the individual's information and decision-making requirements, as well as their perception of the tasks. Mismatches between job requirements and workers capabilities provide the potential for human error”*.

For the Individual - i.e. competence, skills and knowledge, attitudes: *“People bring to the job personal attitudes, skills, habits and personality which can be strengths or weaknesses depending on the task demands. Individual characteristics influence behaviour in complex and significant ways. Their effects on task performance may be negative and may not always be mitigated by job design. Some characteristics, such as personality, are fixed and cannot be changed. Others, such as skills and attitudes, may be changed or enhanced”*.

Within the Organisation - i.e. staffing, roles and responsibilities, learning: *“Organisational factors have the major influence on individuals and group behaviour, yet it is not uncommon for this to be overlooked during the design of work and in the investigation of accidents and incidents. Organisations need to establish their own positive health and safety culture. The climate needs to promote employee involvement and commitment at all levels, emphasising that deviations from established safety standards is not acceptable”*.

4.3 THE JOB

This section will look at those tools, techniques and procedures that are available to facilitate the employment of disabled individuals to function in a safe manner when engaging in job tasks.

4.3.1 Assistive Technology (AT)

One set of tools that is available for employees with disabilities to assist them on the job is the one defined as assistive technology (AT). Abbott (2005) undertaking research in the UK considered the use of AT to improve accessibility of computer systems and physical workplaces. AT refers to the equipment that is used to maintain or improve the functional ability of individuals with disabling conditions, e.g. hardware or software that facilitates computer use, such as through non-standard input or output devices (Abbott, 2005). Abbott noted that there are more than 26,000 devices available, and selecting the right one can be costly and time consuming for employers. To be effective a device must address the needs of the individual worker with the disability and also those of co-workers, it must be compatible with existing workplace equipment and not disrupt existing work arrangements. Abbott (2005) provides some examples of AT which can be used for various disabilities:

Visual impairment AT solutions:

- Screen readers - can listen to information being spoken instead of reading it on a screen, the software allows the individual to specify which area of the screen should be entered into the speech synthesiser. A text to speech facility is a hardware device that converts text to speech. In open plan offices the user can wear earphones.
- Screen enlargers - like a magnifying glass, enlarge part of the screen to make it more legible. Some, can adjust the way the image appears on the screen to suit their eye condition.
- Speech recognition software - allows people to give commands and enter data using their voices.
- Braille - not many use this - as some visually impaired individuals have never learnt to read Braille, nor achieve a level of proficiency that would allow them to easily use the information in that format. Some people prefer to use Braille for computer input. This can be achieved by using a Braille note taker, which includes a special keyboard. Refreshable Braille displays provide tactile output of information represented on the computer screen. The displays mechanically lift small rounded pins to form Braille characters. Optical character recognition converts printed documents into a format accessible to them.
- Some users may just benefit from a flat screen and an arm to move it closer and angle the screen for optimal viewing.

Hearing loss - AT solutions:

- Telephone receiver amplification - different devices are designed for those that wear a hearing aid and for those that do not. The standard telephone headset can be replaced with an amplification device with volume adjustment.

- Text telephones - displays a line of text in place of an auditory signal. Personal computer - personal computers can be configured so that incoming calls are indicated on the screen.
- Speech amplification - can be used in meetings - different ones depending on a group or one-to-one meeting. In-group meetings amplification aids are usually needed - individuals can use a receiver with a neck loop or headset.

Learning difficulties and dyslexia:

- Optical character recognition (OCR) reading systems benefit many visually impaired individuals. Word prediction software helps alleviate cognitive problems - it guesses the word an operator is typing. This type of systems is being used more and more for those with learning disorders to help extend their vocabulary.

Mobility and dexterity:

- Software packages available to help those with mobility problems use a keyboard more easily, e.g. having in place an on-screen keyboard so that the user selects letters with a mouse, joystick or tracker ball.

One important aspect of the use of these types of tools, after they have been implemented, is the follow up assessment to ensure that there is an optimal match between person and technology and also to identify any new problems. The aim of AT is that employees can do their job productively and safely (Abbott, 2005), and this will only be realised if the person and tool are compatible.

AT is often crucial in removing barriers to employment, and in enabling workers with disabilities to work more productively. Yeager, Kaye, Reed and Doe (2006) surveyed people with disabilities using independent living centres in California, to identify barriers to employment and study the use of job related AT to overcome such barriers. A majority of working respondents reported using AT or services to perform job functions. The vast majority of those using job related AT reported substantial benefits to their productivity and self-esteem. Employees' requests for AT as a workplace accommodation were granted more often than not, but there are cases where many other employees had to pay for their own workplace AT.

Further, AT addresses functional limitations that may otherwise limit the participation of people with disabilities in society (Scherer, 2000). It also plays a significant role in meeting the goals of the independent living movement. In particular, AT can aid many people with disabilities to work: to get to and from the job, interact with others, and perform the essential duties of the job - something they would not be able to do without such technology (Langton and Ramseur, 2001).

Several studies have shown that there are general unmet needs for AT among people with disabilities. Yeager *et al.*'s (2006) main findings identified that the majority of employed respondents reported using some form of AT, or accessibility features such as ramps or ergonomic furniture or services such as job coaches or personal assistants to perform work duties. Telephone headsets were the most commonly used AT devices at work, followed by wheelchairs, magnifiers, adapted computer screens, tape recorders, and voice activated software. Adapted keyboards, wrist splints, adapted mice, and screen readers were used by five to six per cent of working respondents. An important observation is that many people use devices and services designed to accommodate not only their primary disability, but also a wide variety of secondary disabilities (Yeager *et al.*, 2006).

4.3.2 Specific Information Technology Devices

In the current work environment it is necessary, at times, to adapt technology to make it usable and understandable for those who require it. When advanced operations can be performed through simplifying methods, new opportunities are created for individuals with disabilities who then get a chance to take greater control of their own lives (Barkvik and Martensson, 1998). There are various information technology (IT) assistive technologies that have been developed to aid employees with disabilities in carrying out their work. The review of the literature identified some key studies, which describe various systems and consider their usability and effectiveness.

Furniss, Lancioni, Rocha, Cunha, Seedhouse, Morato and O'Reilly (2001) described the development, evaluation and use of VICAID, a system based on a simplified palmtop computer. The VICAID system enables a person with a developmental disability to access pictorial instructions designed to help him or her in the accurate completion of tasks. The emphasis in recent years on skill development has been complemented by a growing interest in the possibilities of new technologies to support persons with severe and profound development disabilities, in performing complex social domestic and work tasks even when they lack the skills to do so independently (Lancioni, 1994, cited in Furniss *et al.*, 2001). These developments have gained further impetus from the development of supported employment. Supported employment ensures that individuals with severe disabilities are employed with the appropriate support in place (Conley, Rusch, McCaughrin and Tines, 1989). To date, the supported employment movement has achieved considerable success with persons with mild and moderate developmental disabilities, but has had limited impact on opportunities for persons with more severe disabilities (Conley *et al.*, 1989).

The goal of the VICAID project was not to assist users to deal more effectively with existing life demands but to enable them to access a new range of vocational experiences, which had previously been regarded as beyond their capabilities (Furniss *et al.*, 2001). The study showed that:

- Following relatively brief instructions in using the system, people with severe disabilities can employ these systems to maintain relatively high levels of correct responding in completion of complex domestic and vocational tasks.
- Such users and especially those with attentional difficulties maintain higher levels of task accuracy when using such systems than when using pictorial instructions presented on cards or in booklets and most prefer using computer aided systems to working with card/booklet support (Lancioni and Oliva, 1988, cited in Furniss *et al.*, 2001).

The authors suggest that the development of the VICAID system has demonstrated that advantages of computer-aided systems can be replicated with small, portable systems, which can be used in a variety of real-world environments.

A project by Barkvik and Martensson (1998) highlighted further work examining the use of computer-aided systems. They aimed to give intellectually handicapped people with other disabilities a larger choice of opportunities for work, to develop and raise the quality of their work experience and to help raise their level of independence. The project was one of many that received financial support from the Swedish Handicap Institute in Stockholm. The research outlined a computer system called 'Flexilager'. Flexilager is both a specially designed computer programme and a method to enable intellectually handicapped people to handle stock and storage functions in a new visual way. Flexilager comprises a computer programme and flexiboard, (a command panel). This made it possible for the twenty intellectually handicapped

people involved in the project department to independently handle stock, orders and inventory for the articles within their field of production.

Barkvik and Martensson (1998) suggest that Flexilager could be a method to create new work possibilities. The method is flexible and can be adjusted to different handicaps and to different levels of complexity.

4.3.3 Accommodating to the Job

One way to ensure that disabled individuals are comfortable at the workplace is by engaging in inclusive employment, and as highlighted by Martz (2007), inclusive employment involves a work setting that is physically accessible, and which fosters an attitude that is supportive of individuals with disabilities. Martz (2007) conducted research with a purpose of examining the barriers to work faced by individuals with disabilities in the Russian Federation. Data were collected from 316 Russian adults with disabilities residing in various Russia cities, from which the authors identified a total of 1,915 barriers to work. Their list included physical barriers, attitudinal barriers, and a lack of facilities. Further, this sample reported a total of 1,718 accommodations that they would require to enable them to obtain work and to continue to work, including accommodating their physical and time-related needs, as well as those related to working conditions or job tasks. A disability accommodation is defined as a “*logical adjustment to a job and/or the work environment that enables a qualified person with a disability to perform those duties of that position*” (Brodwin, Parker and DeLaGarza, 2003, p. 212, cited in Martz, 2007).

Bruyère, Erickson and Van Looy (2004, cited in Martz, 2007) conducted a survey with human resource professionals in the USA and in the UK about the extent of accommodations for individuals with disabilities. The top four types of accommodation that were reported in the USA were modifying the accessibility of facilities, restructuring jobs (including work hours), reassigning individuals with disabilities to open positions, and acquiring or modifying equipment. In the UK, the top four were flexibility in implementing human resource policies, in modifying the accessibility of facilities, in modifying the work environment and in acquiring or modifying equipment. As Martz (2007, p. 324, outlining from Murray, 2007) noted, “*There is a growing awareness that many of the obstacles which disabled people face in seeking to earn a living arise from the way society is structured and organised (e.g. lack of access to education, training in employable skills, buildings, public transport) rather than from the disability itself, as well as from mistaken assumptions about the working capacity of disabled persons.*”

Overall, the results from Martz’s (2007) research indicate that the barriers were multidimensional, consisting of attitudinal and physical barriers, as well as the lack of facilities in the working environment, but that these barriers also included a lack of employer provided accommodations. These data show that the attainment of inclusive employment is not readily available and that employers may need to engage in a consistent effort for it to be realised.

4.3.4 Mental Disability

The health and safety of individuals with mental disabilities is an important aspect of the present research. Mental disabilities can be among the most disabling conditions in modern work environments that place a premium on cognitive skills (Stuart, 2007). In his research paper, Stuart (2007) reviews recent publications focusing on mental disability in working populations, with a particular focus on employment equity for people with mental disorders. Mental

disabilities are among the most economically disabling of all health conditions and it has been estimated that 13 to 15 per cent of all employees will experience some form of mental health difficulty during their working lives, with depression representing the most frequent problem (Stuart, 2007). Consequently it is important that adjustments and accommodations for those with mental disabilities are implemented to the same extent as adjustments for those with physical disabilities. This would ensure legal requirements are met and would make both good business sense and market the organisation as an employer of choice.

Research has implicated three kinds of workplaces with increased prevalence of mental disorders, suggesting that there is a possible etiologic link; jobs with high demands (e.g. long hours, and stressful working conditions) and low control; jobs in which rewards are perceived to be disproportionate to work requirements so that workers find the workplace demoralising; and workplaces that are experienced as unjust either because of poor treatment by managers or unfair decision making (Sanderson and Andrews, 2006). It follows that if organisations look to improve the well being of their workforce generally, they will also be working towards improving the working environment of their employees with disabilities.

4.4 THE ORGANISATION

This section will examine how organisations can ensure that the working environment facilitates the employment of disabled individuals.

4.4.1 The Legal Perspective

The DDA aims to open up the workplace to disabled persons, whereas the health and safety law has not had a specific focus on their inclusion. Non-discrimination demands that the wishes of a disabled person to work be given a high priority. However, protectionism may require a person's exclusion from the workplace for the greater good or for his or her own good (Davies, 2001). Despite this, employers should ensure that their compliance with health and safety laws does not result in them ignoring the wishes of a disabled person to work, where they fear that health and safety risks may arise. While the duty to make reasonable adjustments applies only to those employees who meet the DDA's definition of disability, all employees with a level of ill health or disability with health and safety implications are protected by the employer's duty to make reasonably practicable adjustments under the HSAW Act (1974; Davies, 2001).

Acceptance of risk to self is an important principle, established in 1974 with the Health and Safety at Work Act. All employees (including those with disabilities) have certain duties. They must take reasonable care of themselves and other people if affected by what they do, and must cooperate with their employers, when the employers are attempting to comply with health and safety law. When the employer has taken all reasonable steps, and a risk remains, the employer and the employees must consult each other over whether the risk is acceptable. Potentially increased susceptibility in the case of an employee with a disability does not prevent employment or merit dismissal. But as the Employers' Forum on Disability⁷ outlines, "*Where employers have acted reasonably to reduce risk and the employee is informed about this residual risk, an action in negligence for resulting harm will fail*" (cited in Gates, 2001, pp. 17-18).

⁷ <http://efd.org.uk/>

Further, the Employers' Forum on Disability (as cited in Gates, 2001, p. 18) also states that, "There is no duty on the employer to remove all possible risks to health and safety. Providing that the employer has acted properly, no liability will arise, (but if he were to dismiss the employee in spite of her expressed desire to return to work) ... a risk that does not give rise to liability under health and safety law is unlikely to be regarded as a substantial reason and so (under the DDA) will not justify discrimination."

In 2000, Jackson, Furnham and Willen found that employers' willingness to act in accordance with the DDA was dependent on their attitude towards disabled individuals and their knowledge of the legislation. That is, those who were more knowledgeable and had more favourable attitudes were more willing to act in accordance with the legislation. Further, the researchers noted a large number of physical disabilities are not covered by the DDA, and that these 'lesser disabilities' are not legally protected by the Act and may cause individuals with such disabilities to meet with discrimination from employers.

4.4.2 Adjusting the Work Environment

Nevala-Puranen, Seuri, Simola and Elo (1999) noted in their research that the work environment and work tasks should be adapted by employers to make work possible for people with permanent disabilities. They suggested that workers with disabilities could be exposed more to potentially hazardous situations at work than healthy workers, and the regular need to use other people to complete work tasks, especially around machinery, creates additional hazards. Nevala *et al.* (1999) further recognise that the occurrence of a fire in the workplace is also a threat to those workers with disabilities who have restricted mobility, while those with visual impairments could find it difficult for colour and depth perception; that hearing impairments could hinder the detection of machine failures; and muscle fatigue resulting from the use of only one arm or leg could contribute to the risk of an accident.

Further research into job adjustment for employees with disabilities includes that by Steinberg *et al.* (2002), which discusses accommodating the members of a medical school faculty with disabilities. The authors examined the University of Pennsylvania School of Medicine initiatives, which explored the concerns of those members of the faculty with sensory and physical disabilities. They revealed that many members of the faculty with disabilities resist seeking job accommodations. They noted that potentially useful job modifications would include adjusting timelines for promotional decisions; reassessing promotions requirements that inherently require extensive travel; improving physical access to teaching, research and clinical sites; and modifying clinical and teaching schedules.

In their paper Steinberg *et al.* (2002) consider the Americans with Disabilities Act of 1990 (ADA), stating that reasonable adjustments include ensuring physical access for employees with disabilities. The members of the university faculty with physical disabilities reported needing to enter campus buildings through loading docks and found themselves trapped in locked buildings after hours. Further, they were unable to access library stacks; they could get stuck on ramps in deep snow; they struggled with heavy doors and were unable to locate accessible toilets. In addition, the modifications in place to enhance access such as ramps and automatic doors were often poorly maintained, and wheelchair access routes were often not clearly marked. Due to space constraints some of the old buildings on the campus sometimes house academic departments, despite having neither wheelchair access nor elevators. Finally, they found wheelchair lifts and mini buses are often unreliable.

Steinberg *et al.* (2002) report that the faculty were continually facing obstacles, inconveniences, and dangers in the workplace, all of which were exhausting and demoralising. They recognised

other modifications that were not present, inclusive of: cavernous amphitheatres and meeting rooms that were rarely equipped with acoustic panelling or devices to assist people who were hard of hearing, and Braille signage was often missing. They noted that some of the helpful technologies that could be included were: telecommunication devices for the deaf, voice-activated controls on elevators, voice activated computer systems and software, enlarged print written materials and hands free telephones.

In their conclusion, Steinberg *et al.* (2002) discuss some suggested alterations, which include modified work schedules, flexi leave policies, part time hours, time for medical appointments, providing assistive technologies and staff support. Also, ramps need to be present at all central locations in positions equal to able-bodied people and must be accessible at all times in all weathers. Any automatic doors should be checked regularly to ensure a smooth operation; and policies need to be in place for reporting mechanical failures and fixing them. In addition, the shuttles around campus should be accessible by all; and internal doors should have push rather than pull handles; and at least one bathroom on each floor should be wheelchair accessible.

Byers, Sawchuk and Smith-Bayley (1998) discussed the relationship between ergonomics and employment adjustments made in the Ministry of Community and Social Services (MCSS) workplace. Their research considered the contribution that each makes in the design and implementation of workplace systems and in the accommodation of employees with disabilities.

Byers *et al.* (1998) argued that it makes good business sense to provide healthy, safe and accessible workplaces for all employees. Healthy workplaces result in fewer work-related injuries/illnesses and increased productivity for both the able bodied and disabled population. The implementation of ergonomic principles in the design of the work environment benefits the employer and the majority of workers. This is achieved by ensuring that the demands of the work and design of the workplace are within the abilities of the working population, thus contributing to a healthy, safe and productive environment. In many cases, persons with disabilities require individual employment adjustment to ensure productive and safe access to the workplace.

4.4.3 Accessibility

Accessibility for employees with disabilities is an issue that should be highlighted. It is important to take into consideration the accessibility of the workplace in terms of getting there and also being there. Again, employers must ensure that the workplace is accessible for employees with disabilities while ensuring that they adhere to health and safety requirements.

Research by Vilar, Filgueiras and Rebelo (2007) resulted in the creation of a tool for evaluating the accessibility of a workplace in order that a disabled person can both carry out his/her job and meet health and safety requirements. The main aim of the tool is to help social inclusion of people with disabilities. This includes the politics that the companies must adopt, the legal aspects and the physical and social barriers found in the organisations. They considered physical, sensorial and cognitive deficiencies and created a guide based on a human centred methodology to turn the evaluation into an easy and helpful ergonomic tool. The guide was divided into accessibility 'to the' workstation and accessibility 'in the' workstation, both of which considered the physical and informational accessibilities. They were also divided into two accessibility levels: the minimal and the adequate level, which represented the accessibility degree of the company. Three hundred and eleven variables (including the parking area, stairs, ramps, doors, lifts and seats) were deemed necessary to evaluate according to being either at a satisfactory level of accessibility (level one) or having a higher level of accessibility (level two). The organisation must be at least level one to be considered accessible without discrimination.

Level one is defined as a satisfactory level of accessibility where those with disabilities can access and circulate the building in a safe and autonomous way. The next and final stage is level two where organisations provide a higher level of accessibility where they have departments and employees with proven competencies in the field of people with disabilities.

The methodology used was meant to aid ergonomic interventions for promoting an inclusive work design and safety for workers, and for creating good working conditions, that will in turn increase human performance (Vilar *et al.*, 2007). The tool was evaluated in a large company and a newly devised programme, the INCLUDE programme, was used to implement it throughout Portugal. This programme aimed to promote accessibility in the workplace in order to allow autonomous and safe access for all.

Vilar *et al.* (2007) emphasise that improving the accessibility of a company is an important aspect to get better work conditions, particularly in terms of work design and safety for the workers in order to increase human performance.

4.4.4 Social Stigma

Employer attitudes play a central role in the extent to which people with mental disabilities are accepted into the workforce and the extent to which workplace accommodations are made (Stuart, 2005). The existence of equal opportunities policies in an organisation can assist in producing fair treatment in the workplace (Bagshaw, 2004).

Therefore social stigma appears to remain the key barrier to full employment of people with mental disabilities. Research also shows that employers express common stereotypes of mental illness; believing that mentally ill workers are limited in their ability to perform many types of work, but particularly work involving cognitive skills or work that is stressful (Scheid, 2005).

Stuart (2005) concludes that a considerable amount of effort in the vocational and rehabilitation field has been directed to increasing employment among persons with mental disabilities. Research has demonstrated that supported employment and other person-specific employment support systems are effective in helping people with mental disability obtain competitive employment. Supported employment programmes, however, are not widespread, and even among the most successful programmes, a large proportion of people remain unemployed or underemployed.

Disability management strategies have been successful in preventing or accommodating physical disabilities in the workplace. Similar success has not been realised in the realm of psychological/mental health related disabilities. Integration of the principles and strategies of psychosocial rehabilitation and disability management programmes can assist employers to control costs related to psychological/mental health disabilities and protect individual workers employability (Olsheski, Rosenthal and Hamilton, 2002).

Bagshaw (2004) notes that the existence of equal opportunities policy within an organisation does not focus on individual qualities and talents, or address the potential that could be realised by tapping into the synergy of these differences. This led him to promote the four Cs of working with diversity, which is very relevant to employees with disabilities:

- (1) Check and test assumptions, (including groupthink).
- (2) Communicate empathy and respect.

- (3) Create a climate of inclusion.
- (4) Challenge inappropriate behaviour.

4.4.5 Employee Assistance Programmes (EAPs)

Olsheski *et al.* (2002) highlight that the integration of employee assistance programmes (EAPs), or other psychiatric rehabilitation interventions with disability management, has lagged behind the prevention and accommodation of physical disabilities. They argue that accommodations for psychiatric disabilities are less tangible and consequently employers and service providers have found it difficult to implement changes in the psychosocial requirements of jobs. In order to serve employees who have psychological limitations, disability management programs must adapt the job analysis method used to measure the physical demands of jobs so that these tools can also measure mental or psychosocial demands of jobs.

In addition, supervisors and other involved parties need to be educated about the individual's strengths, limitations, and the nature of accommodations. Olsheski *et al.* (2002) further recognise that disability management programmes rely on the use of job analysis data to develop transitional work return plans and job accommodations for employees with physical limitations. If employees who have psychosocial limitations are to be served in disability management programmes, it is essential that more effective and precise methods of psychosocial job analysis are developed. Transitional work return services are an essential component of employer based disability management programmes. Transitional work, as used in disability management is defined as, "*any job or combination of tasks and functions that may be performed safely and with remuneration by an employee whose physical capacity to perform functional job demands has been compromised*" (Shrey and Olsheski, 1992, cited in Olesheski *et al.*, 2002, p. 67).

Olsheski *et al.* (2002) conclude that through the use of various disability management strategies including the development of joint employee-management steering committees, job analysis, transitional work, staff development, and case management, employers can create an organisational climate that allows for the integration of psychosocial rehabilitation interventions. Psychosocial disability management strategies can help employers control costs related to mental health disabilities and protect the individuals' employability.

4.4.6 Evacuation During Emergencies

There has been research to suggest that an aspect of health and safety, which needs to be addressed for people with disabilities, is ensuring their inclusion in evacuation procedures, and making reasonable plans for safe evacuation during an emergency. The ADA requires employers to modify their policies and procedures to include people with disabilities and these requirements also apply to evacuation plans.

Cameron (2005, p. 2) established that individuals who are disabled:

- "Are not now sufficiently included in emergency planning, and little, if any, communication exists between planners and the disability community,
- Have a wide variety of communication, support and health needs that differentiate them from persons without disabilities, and

- Tend to live in low income areas that include areas at higher risk for emergencies and lack critical infrastructure.”

Research by Loy, Hirsh and Carter Batiste (2006) found that interest in emergency evacuation planning had increased since the September 11th 2001 terrorist attacks in the USA. In addition, the American Job Accommodation Network (JAN) started receiving more questions about how to include employees with disabilities in such plans. The JAN case data on the emergency evacuation of people with disabilities was reviewed and findings from this indicated that research and experience demonstrates that the needs of employees with disabilities are often omitted during the emergency-preparedness planning process (USA’s Department of Labour, 2004, cited in Loy, Hirsh and Batiste, 2006). Research also shows that many people with disabilities still do not have information on how to safely evacuate their workplaces (Taylor, 2001).

Possible emergency evacuation accommodations for employees with disabilities may include:

- Evacuation devices that help others assist people with motor impairments down stairs or across rough terrain;
- Tactile signage and maps for employees with vision impairments;
- Alerting devices, vibrating paging devices, wireless communicators, or two way paging systems to alert individuals with hearing impairments of the need to evacuate;
- Alpha-numeric pagers or other communication devices for individuals with speech impairments so they can communicate with others in an emergency;
- And alternative methods of practicing emergency evacuation for people with psychiatric impairments that experience anxiety during evacuation drills (Loy and Carter Batiste, 2005).

Loy, Hirsh and Carter Batiste (2006) concluded from their review that more effort is needed to ensure employers develop emergency evacuation plans that include people with disabilities before a crisis occurs. They suggest that employers need to recognise the importance of accommodating people with disabilities prior to an emergency.

Employees with disabling or limiting conditions may get left behind during evacuations, unless employers make proper provisions (Bruyère and Stothers, 2002). Bruyère and Stothers provide guidance to employers when devising new plans and procedures for safely evacuating buildings, to ensure that their plans include everyone. They suggest ten steps to help all employees to escape from a building in case of an emergency:

1. Identify persons who will need assistance.
 - E.g. people with mobility impairments, individuals with arthritis, people with hidden disabilities such as heart problems, those with breathing difficulties, people with cognitive impairments, individuals who are blind or deaf.
2. Consult those identified.
 - Work with individuals to select any necessary assistive equipment and set up procedures for ensuring a safe evacuation.
3. Conduct evacuation drills, both planned and surprised.

4. Consider a 'buddy system' where non-disabled volunteers assist people with disabilities.
5. Make sure that all hallways and stairways are clear.
6. Install visual and audible alarms and ensure that they are in working order.
7. Install an evacuation chair on each floor for every person who needs one.
8. Ensure accessible and reliable communication.
9. Provide appropriate equipment and assistance outside of your building.
 - After they evacuate a building, individuals may need certain equipment.
10. Include disability-related supplies in office first aid kits.
 - These may be invaluable in the aftermath of an emergency.

Bruyère and Stothers (2002) suggest that a universal design approach to meeting the needs of people with disabilities before and after a disaster will benefit many people without disabilities such as the very young or the aged.

The UK's government has produced a document that examines escape procedures for individuals with disabilities during a fire (DCLG, 2007). This currently is available for free download via the Internet and provides guidance on one type of evacuation.

4.5 THE INDIVIDUAL

The section that follows seeks to address those qualities that individuals bring to a job - e.g. competence, skills and knowledge and attitudes - which are not necessarily influenced by disability, but are based on the individual, and should be the influencing factor for employment.

4.5.1 Why Work?

There are employees with disabilities within the workforce, who wish to continue working, but this need is not always recognised by employers, as they may not necessarily acknowledge that an employee has a disability. Campbell (2004) argued that safety professionals who think that they do not have any employees with disabilities in the workforce are almost certainly mistaken. Campbell (2004) highlights that disabilities can range from sensory impairments to physiological impairments (diabetes, chronic fatigue syndrome) to neuromuscular problems. As disability is *an individual issue*, any focus for health and safety needs to be at that level, rather than at a generic level of *the disability*.

For their study conducted in Finland, Nevala-Puranen *et al.*, (1999) aimed to assess the impact of the following on employees with disabilities: the journey to and from work, physical load, redesign measures, and mental strain at work among workers with disabilities. The participants needed to be employed, to use a mobility aid (e.g. crutches, cane, elastic support, prosthesis, manual or electric wheelchair or a walking frame), and to receive a heightened or special disability aid (which is paid to those permanently disabled). The data were collected via a telephone interview. The authors found that it was common for participants to suffer anxiety

and depression but most were satisfied with their work and regarded it as important. The main findings showed that the journey to and from work (impacted by e.g. weather, traffic jams and hurrying) were the factors to cause the most strain. Seventeen per cent ($n = 42$) of participants had had an accident on the way to work but 48 per cent of them did not need sick leave. Occupational health care was not arranged for 15 per cent of disabled persons, even though this is obligatory in Finland. Further, few ergonomic redesign measures had been carried out to improve the work conditions of workers with physical disabilities. The authors recognised that proper workplace design and the use of elastic supports and devices for handling materials would make the work easier and lighter for disabled persons. The authors concluded that employees with disabilities are the best ones to comment on their disability and also highlight what is needed for them to function most efficiently at their job.

4.6 SEXUAL ORIENTATION, DISABILITY AND HEALTH & SAFETY

As highlighted previously there has not been any relevant research found in respect of assessing the connection among health & safety, disability and sexual orientation (e.g. lesbian, gay, bisexual and transgender - LGBT). The data that are available show discrimination occurring to individuals based on both their disability and sexual orientation. As Harley, Nowak, Gassaway and Savage (2002) stipulated, sexual orientation and disability must be seen as interconnected, rather than as comparable occurrences, as they do influence each other.

The following points are taken from the article by Harley *et al.*, and provide a starting point from which to build in this area. The research was based on a university population.

- Little is known about the experiences and sexual identities of lesbian, gay, bisexual and transgender individuals with disabilities.
- Individuals are accommodated because of their disability, but excluded based on their sexuality.
- Disability and sexuality are seen as separate entities.
- Persons with disabilities have been desexualised.
- Individuals with disabilities may not be accepted into (and are often excluded from) the gay community.

Overall, individuals with disabilities who are LGBT are a much smaller minority than those who are disabled. Further, they seem to experience a trilogy of discrimination based on their disability, sexual orientation and for some, racial and ethnic identity (Harley *et al.*, 2002). Social stigma may be even more pertinent with this group and should be explored further. Overall, research is needed to determine if individuals have more difficulty in gaining assistance to comply with health and safety requirements based on both their sexual orientation and disability.

5 CONCLUSIONS

5.1 ENGAGING WITH EMPLOYEES WITH DISABILITIES

Employees with disabilities can be viewed as a substantial force within the UK economy. There are 6.9 million people of working age (2007 data) who may be capable of contributing significantly to the economy. The present report aimed to identify the most recent research on health and safety issues and disability, with emphasis on summarising the current relevant evidence relating to ensuring that employers adhere to health and safety requirements whilst meeting the needs of employees with disabilities.

The research on which the present report is based showed that employees, including those defined as disabled, must take reasonable care of themselves and other people affected by what they do and must cooperate with their employers when they are attempting to comply with health and safety law. Under the Disability Discrimination Act, employers have a duty to make reasonable adjustments to the workplace and in addition must also meet duties under the Health and Safety at Work Act (1974). The main duty of employers, under the HSAW Act (1974), is to ensure the health, safety and welfare of all employees as far as is reasonably practicable. This is highlighted as well within the Management Standards⁸, which stipulate for example, that *systems need to be in place locally to respond to any individual concerns and employees are consulted over their work patterns*. Ensuring compliance with health and safety laws should not give employers automatic permission to ignore the wishes of a person with a disability to work, where they fear that health and safety risks may arise. Employees with a level of ill health or disability with health and safety implications are protected by the employers' duty to make reasonable practical adjustments under the HSAW Act (1974).

It is important to obtain senior management support in ensuring that employees with disabilities are accepted in the workplace and are able to contribute, to a safe and healthy standard once employed. Research has shown that directors within organisations have a strong influence over the entire system, as they are able to mould how managers interpret health and safety policies, and how they promote healthy and safe attitudes among employees (Miller, 2005). Further, Dibben, James and Cunningham (2001) stated that senior management commitment to disability within the workplace is a best practice that should be encouraged to improve the acceptance of this group of workers within industry.

The present study has shown that there has been a substantial amount of research conducted on the various possible accommodations that can be made by an employer for employees with disabilities, (see Campbell, 2004; Steinberg *et al.* 2002). The research considered accommodations that include AT for employees with disabilities to aid them in carrying out their work. These included ergonomic interventions that are available for promoting an inclusive work design and safety for workers, and also for creating good working conditions, all of which will in turn increase human performance (Vilar *et al.*, 2004). Improving the accessibility of a company is important in order to get better work conditions, particularly in terms of work design and safety for workers, in order to increase human performance.

Research, from the UK, shows that there are more than 26,000 assistive technology devices available to aid employees with disabilities in their work. Therefore selecting the correct one can be a costly and time-consuming task for employers. To be effective a device must address the needs of the individual worker with the disability and also those of co-workers. It must be compatible with existing workplace equipment and not disrupt existing work arrangements

⁸ <http://www.hse.gov.uk/stress/standards/standards.htm>

(Abbott, 2005). However, as these devices do enhance the performance level of employees with disabilities, it is beneficial to explore the ones that are most suitable, across individuals and organisations, and this could entail exploring with employees what works best for them.

The barriers to employment for disabled individuals are multidimensional, and tend to primarily be attitudinal and physical barriers in the environment, but also include a lack of employer provided accommodations. AT is often crucial in removing those barriers to employment and also in enabling workers with disabilities to work more productively. AT also addresses the functional limitations that may otherwise limit the participation of people with disabilities in society (Scherer, 2000).

With the increasing reliance upon information technology in a large proportion of workplaces, there have been a number of computer based assistive technologies developed to aid employees with disabilities in completing their work. Among those are VICAID and Flexilager, both of which have shown to be successful.

The research also considered the health and safety at work for employees with mental disabilities. Mental disabilities are among the most economically disabling of all health conditions and while disability management strategies have been successful in preventing or accommodating physical disabilities in the workplace, the same success has not been realised in the realm of mental health related disabilities (Olsheski *et al.* 2002). Accommodations for psychiatric disabilities can be less tangible and therefore employers find it difficult to implement changes in the psychosocial requirements of jobs, which may warrant further research.

One area that does not seem to be addressed consistently within organisations is that of evaluation. Since the terrorist attacks of September 11th 2001, evacuation procedures for employees with disabilities have been considered more widely, especially within the USA, but still do not appear to be consistently or continuously maintained. Despite this, employers must ensure the inclusion of employees with disabilities in evacuation procedures and make reasonable plans for safe evacuation during emergencies. Various research, including that by Bruyère and Stothers (2002), suggests that there are various steps that employers should take to help all employees to escape from a building in the case of an emergency. It may be necessary to determine if organisations know of these guidelines.

It is clear from the research that there are a large number of employees with disabilities within the workforce; however this is not always recognised by employers, and may be a factor in why a larger percentage of accommodations are not in place. Research by Nevala-Puranen *et al.* (1999) highlights that whilst there are a wealth of hazards that workers with disabilities might face on a daily basis, often employers do very little to accommodate their needs. However, in their research they also noted the continued job satisfaction of workers with disabilities. Therefore, it might be sensible that whilst it is essential employers adhere to the law, what is important is to ensure **all employees experience job satisfaction in their work** and should also be considered along with any potential adjustments. Any decisions made should be in consultation with the individual employee. Byers *et al.* (1998) promoted this concept as they advocated that is assisted in the development of healthy workplaces.

Overall, the research evidence suggests that there are many options available to employers to ensure that employees with disabilities are able to carry out their work in a safe and healthy way, while still complying with health and safety laws. Different types of disability may require different accommodations or adjustments in the work place. Therefore employers and employees must consult with each other, in order to ensure that the most suitable changes are made to ensure inclusion into the work place.

5.2 RESEARCH GAPS

As Campbell (2004) notes, there are a wide variety of disabilities that fall under the remit of the DDA. However, there appears to be a lack of evidence surrounding the prevalence of the different disabilities. This may need to be explored further to obtain the necessary information on the scope of disabilities, and to highlight that one solution will not be pertinent for these varying conditions.

The research highlighted that there are a wide variety of adjustments that could be made by employers to accommodate workers with disabilities efficiently (Campbell, 2004; Steinberg *et al.*, 2002). However, although Campbell (2004) discusses different adjustments that could be made to accommodate workers with disabilities, it is unclear how effective these adjustments are in enabling workers with disabilities to complete their work and indeed the extent to which they are currently adopted in UK organisations. Aside from research carried out by Bruyère *et al.* (2004, cited in Martz, 2007), identifying the top adjustments made in both UK and USA workplaces, there is a lack of research in this area and more investigations are required.

There still remains a problem that a large percentage of individuals with disabilities are unemployed. The figures provided by Mencap (Gates, 2001), suggests that 88 per cent of the 6.5 million individuals with disabilities of working age are unemployed. It stands to reason therefore that not enough is being done to rehabilitate individuals with disabilities into the workplace. Research could look to identify why employers are failing to affectively employ individuals with disabilities and accommodate their needs once in work. Indeed, Martz's (2007) research noted one barrier to work was the lack of or suitability of employer provided accommodations. It might be that employers need more guidance on typical methods of accommodating individuals with disabilities.

Abbott's (2005) research pointed to a wealth of assistive technologies that are available to workers with disabilities, however, it did not indicate the extent to which these are used by workers and their associated effectiveness. As selecting the appropriate AT can be costly to both employer and employee, future research could look to outline their use and effectiveness in the workplace.

In the USA, employees often have to pay for their own AT (Yeager *et al.*, 2006), it might be beneficial to research this issue in the UK. Research may determine that this is also a barrier to a disabled person in the UK finding and retaining work. This is especially important as the researchers also noted the extensive use and benefits of AT amongst workers with disabilities. If organisations are able to obtain more AT, this may encourage more individuals with disabilities to find and retain suitable work.

Although there has been an increase in developing evacuation procedures for employees with disabilities, this research has been carried out more heavily in the USA, (Loy *et al.*, 2006). Less research was found that focused specifically on the extent and type of evacuation procedures accommodating workers with disabilities adopted by UK organisations, despite evidence from Bruyère and Stothers (2002) highlighting its importance. The UK's government document on escape procedures during a fire (DCLG, 2007) is useful. However, more information and guidance are needed in respect of evacuation, and these should be consistently researched due to the changing work environment and different events that could occur within work places.

Apart from the study conducted by Vilar *et al.* (2007), very little research was found that examined interventions that tackle the physical as well as social barriers to disability employment and accommodation. The tool developed and tested by the researchers took a more

holistic approach to accommodation with good results, and this is a good basis on which to proceed with further research in this area.

6 RECOMMENDATIONS

In response to the findings from the scoping study, the following recommendations are based on future research and/or the dissemination of information in the area of health and safety and disability in the workplace.

1. There is a need to obtain more evidence of the prevalence of different disabilities and disorders. This would enable organisations to have more available information that would allow them to understand and identify with employees with disabilities about those resources that they require to function most effectively at the workplace.
2. The HSE should look to consider the possibility of obtaining evidence of which adjustments/interventions have been put in place and also their effectiveness. This would enable organisations to decide which interventions to use that are best suited to the availability of their specific time, resources and cost. It would be important to consider also the size of organisations (e.g. large or small) that have used the adjustments/interventions. In building this evidence the opinions and perceptions of employees with disabilities, as well as those of their employers, of those adjustments should be obtained.
3. Due to the high level of unemployment of individuals with disabilities, more exploratory research is needed to identify **if** and **why** individuals with disabilities are failing to find and retain employment and also **if** and **why** employers are failing to accommodate the needs of the worker with a disability. Although the employment of individuals is outside the remit of the HSE, if the research shows that employers perceive there is a lack of necessary guidance and support, the HSE could look to fill that gap. This could be done either by more intensive promotion of the information that is available (<http://www.hse.gov.uk/disability/index.htm>), or by devising any new guidance that may be needed. The research may identify that education is needed on the nature of accommodations for employees with disabilities and how to implement them. It might also be useful for employers to have access to information on individual disabilities, and their strengths and weaknesses. A centralised location in which such information is housed would allow employers to access this service, which would help inform decisions on suitable accommodations. A campaign highlighting this information may encourage uptake in this area.
4. More awareness raising is required for health and safety professionals to enable them to recognise disabilities and increase their knowledge and understanding of exactly what constitutes a disability, and how to work with individuals who have disabilities. This is especially in meeting the health and safety needs of such individuals.
5. The research discussed suggests that greater use should be made of supported employment programs, as they appear to be effective. However their use is not widespread. More research therefore may be needed to establish how and why they are effective.
6. The HSE could look to carry out further research to determine the usage of different Assistive Technologies (AT) in UK workplaces. These evaluations may be required to ensure their effectiveness and the suitable match between the individual and the technology.
7. Further interventions in the workplace could look to adopt a holistic approach to accommodating workers with disabilities by removing both the physical and social

barriers. The HSE could first identify and carry out research that examines if there are interventions of this kind currently in use and ascertain their effectiveness.

8. It is clear that employers' stereotypical attitudes towards workers with disabilities are still prevalent in UK workplaces and remain the biggest barrier to full employment. It therefore follows that more needs to be done to reduce the problem. The HSE could look to further work in this area via the use of a campaign to increase knowledge and understanding or provide further guidance and support to employers in order that they feel more confident in their ability to accommodate workers with disabilities.
9. While the current research in this area indicates that accommodations for physical disabilities are becoming more widespread, the same is not true for mental disabilities. Therefore, more help may be needed for employers trying to accommodate those employees with mental disabilities.
10. The use of job analysis techniques would be beneficial in order to identify the key tasks of jobs, and to allocate suitable tasks to employees with disabilities. It might be that further training is needed for supervisors to adapt the job analysis technique to enable them to accommodate workers with disabilities. A greater knowledge of typical accommodations for psychiatric disabilities may give supervisors the confidence they need to implement changes. The HSE could look to provide relevant training and promote disability management strategies more widely.
11. There was much evidence suggesting that organisations are not doing enough to ensure that employees with disabilities are included in emergency evacuation plans. As much of the research in this area has been conducted in the USA, it may be necessary to further research in the UK, to determine the extent of accommodation by employers and whether more input is needed from the Government to ensure organisations develop appropriate evacuation plans. Whilst information on developing accurate plans is available, it may therefore just require effective promotion. Indeed, the inclusion of the evacuation of workers with disabilities in any procedure will also benefit both younger and older workers.

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A scoping study assessing the relationship between disability and health and safety

The Health and Safety Executive (HSE) wishes to gain an understanding of the current research that is available in the area of health and safety and disability to establish any additional areas on which it should focus as an organisation. To meet this requirement the Health and Safety Laboratory (HSL) carried out a scoping study to examine the research undertaken on disability and health and safety at work, and to highlight any gaps in the research. The scoping study considers whether individuals with disabilities are correctly provided for at work, whether they have the necessary access to the workplace, and the health and safety challenges that they may face on a daily basis.

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