ICT use and connectivity of minority communities in Wales

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Literature Review (draft)

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EXECUTIVE SUMMARY

The aim of this literature review is to conceptually frame and analytically ground an AHRC Connected Communities Programme funded project '*Understanding the role of ICT use in connectivity of minority communities in Wales'*. It presents the findings of a preliminary review of the literature in the areas of digital divides, community connectivity and minority communities. It also introduces literature regarding digital divides in the context of Wales in order to contextualise our research. Thus it paves the way for the main aims of the project; namely to systematically review and analyse empirical data in the field and to identify areas for further research which arise from our initial investigations. This document presents our initial review of the literature in the extremely diverse arena of ICTs and connected communities. It does not constitute an exhaustive review of the available literature and should instead be considered a 'work in progress' which will be updated during the course of the project as new themes emerge from our research programme.

In the introduction to this document, we briefly introduce the project and outline its principal aim. This aim will involve a systematic review of existing empirical data and research evidence in order to gain an understanding of the impact of ICTs on changing cultures and patterns of connectivity *within* and *between* minority communities, and the potential of multifaceted digital divides in constraining or shaping these forms of connectivity in Wales. The introductory section also illustrates that in order a systematic review of research data to be conducted, a review of the literature is needed in the first instance. In the remaining sections of the introduction we present the aims, conceptual foundations and structure of the literature review.

The first section introduces the complex, ever shifting and multi-faceted concept of digital divides and debates surrounding its conceptualisation and contextualisation. It casts some light on the importance of this concept for understanding the linked concepts of social inclusion and cohesion. In particular the section highlights the concept's explanatory power in terms of the relative socio-economic position of deprived or minority communities. It concludes by proposing a community approach to digital divides, thus linking this introductory discussion to the review of the concepts of community and (community) connectivity.

The second section discusses the conceptualisation of community and community connectivity. It illustrates that 'community' and 'community connectivity' remain highly ambiguous and nebulous concepts. It introduces a range of approaches to understanding these concepts, such as 'community as tradition', 'community as a moral force', 'symbolic' or 'imagined communities'. The section summarises the literature that explores the argument that ICTs play an important role in reshaping existing communities and provide a catalyst for the emergence of new community forms. At the same time, it explores the literature that problematises the concept of 'minority communities' and understandings of the 'mainstream majority'. The section concludes by examining the concept of 'community connectivity' through drawing on concepts of bridging (inclusiveness) and bonding (exclusiveness) social capital, with different types of social capital performing contrasting roles in fostering connectivity *within* and *between* communities.

The third section discusses ICT, minority communities and connectivity, effectively bringing together the two strands of concepts which underpin the project (i.e. digital divides and community/community connectivity) through an analysis of existing work on digital divides and minority communities. It reviews work on the take-up and use of ICTs by ethnic minorities, examines the importance of language as a factor influencing such trends and reviews previous research on the use of ICTs by people with disabilities. On the one hand, it identifies evidence that demonstrates the enhancement of the feeling and experience of 'connectedness' of minority communities through ICT take-up and appropriation. On the other hand, it identifies evidence concerning the continuing digital exclusion of minority communities. In addition, it discusses and evaluates some of the barriers and connectivity opportunities that specific minority language groups are subject to when they adopt ICTs, thus enriching and informing further the review results obtained for ethnic groups.

The penultimate section of the review outlines the issues that are relevant to Wales in terms of digital inclusion and community connectivity, drawing attention to the relevant policy documents related to digital inclusion. It positions Wales in a broader context while noting its importance and distinctiveness as suggested by previous work in the field. It compares and contrasts work on the digital divide in Wales with that conducted in other contexts, aiming to identify relevant evidence and gaps in the evidence for Wales. In the final section of the paper we summarise the existing evidence as gauged from the review of the existing literature and identify research gaps in the area of ICT access, take-up and use for ethnic minorities and people with disabilities. The concluding section highlights outstanding issues in the literature and provides the case for a systematic review of existing research data if we are to support new methodological and research approaches as well as policy strategies that promote the use of ICT by particular social groups and disadvantaged communities.

1. INTRODUCTION

1.1 Project background

This project aims to gain an understanding of the impact of Information and Communication Technologies (ICTs) on changing cultures and patterns of connectivity within and between minority communities and the potential of multifaceted digital divides in constraining or shaping these forms of connectivity. It uses Wales as a test-bed to explore the ways in which the networking potential and impacts of ICTs are manifested in areas such as connectivity within and between minority communities as well as in public service delivery and participation within minority community networks in the UK. It focuses on two main categories of minority communities within Wales; namely ethnic communities (and their language and cultural attributes) and people with disabilities. Gaps in the evidence base have been identified by the Welsh Assembly Government (WAG) in particular in relation to the general lack of data on certain aspects of digital exclusion/inclusion. For example, data concerning minority groups and the ways in which ICTs can determine changing patterns of participation and connectivity of those groups as more and more services are provided online.

The project proposes to conduct a systematic review of existing research data and evidence. The proposed review has been framed to not only enhance our understanding of community connectivity and minority groups and the role of ICT, but also to identify and begin to address research gaps. By considering the importance of evaluating existing research evidence and research gaps, and through defining communities in 'minority' and 'deprivation' terms, the proposed research review will be designed to also provide conceptual and methodological insights. The research review will involve a systematic analysis of regional data concerning the impact of ICTs on various dimensions, levels and facets of connectivity *within* and *between* minority communities. This also builds on community-based evaluations of earlier initiatives aimed at increasing support for the use of ICTs within deprived communities that have been commissioned by WAG. Hence, the review will provide the foundation for a comparative analysis of government interventions on digital exclusion across the UK.

The project has a set of five overarching objectives:

1 To provide a systematic analysis of regional research data and findings concerning the impact of ICTs on various dimensions of minority communities' connectivity in Wales.

2 To enhance our understanding of community connectivity and minority groups and the role of ICTs in general.

3 To identify and begin to address key gaps within existing research, while providing conceptual and methodological insights which can lead to large-scale, community-oriented and methodologically innovative research in Wales and across the UK.

4 To make recommendations about how research can connect with communities and stakeholders to enhance research and inform policy.

5 To provide the foundation for a systematic comparative analysis of government interventions on digital exclusion across the UK.

To help achieve these objectives, in this paper we review the existing literature base on minority groups' access to, and usage of, ICTs and discuss implications for the connectivity of those groups. The aims, conceptual foundations and structure of the literature review are presented in the next section.

1.2 Literature review: aims

This literature review aims to tackle key concepts and arguments in theory- and research-related literature examining digital divides and ICT use/non-use, on the one hand, and community connectivity and its various and continuously expanding forms in minority communities, on the other. It aims in particular to explore the initial project hypothesis that there may be good conceptual and research grounds for arguing that ICTs constitute an increasingly important vehicle for community cohesion and diversity at the local, regional, national and trans-national levels, thus increasing connectivity of minority communities in particular.

The intended readership for this report primarily includes researchers in this and related fields of work. Also, its preliminary reflections on the links between research, communities and policy-making in the field will be of interest to representatives of minority groups, non-governmental organisations and third sector actors. Many of the issues identified will be pertinent to the work of government at all levels as well as ICT service providers and citizens interested in becoming aware of, and providing support to, new and emerging minority communities. Finally, this review hopes to shed some light on important cultural, technical and ethical considerations for minority communities in general and in Wales in particular.

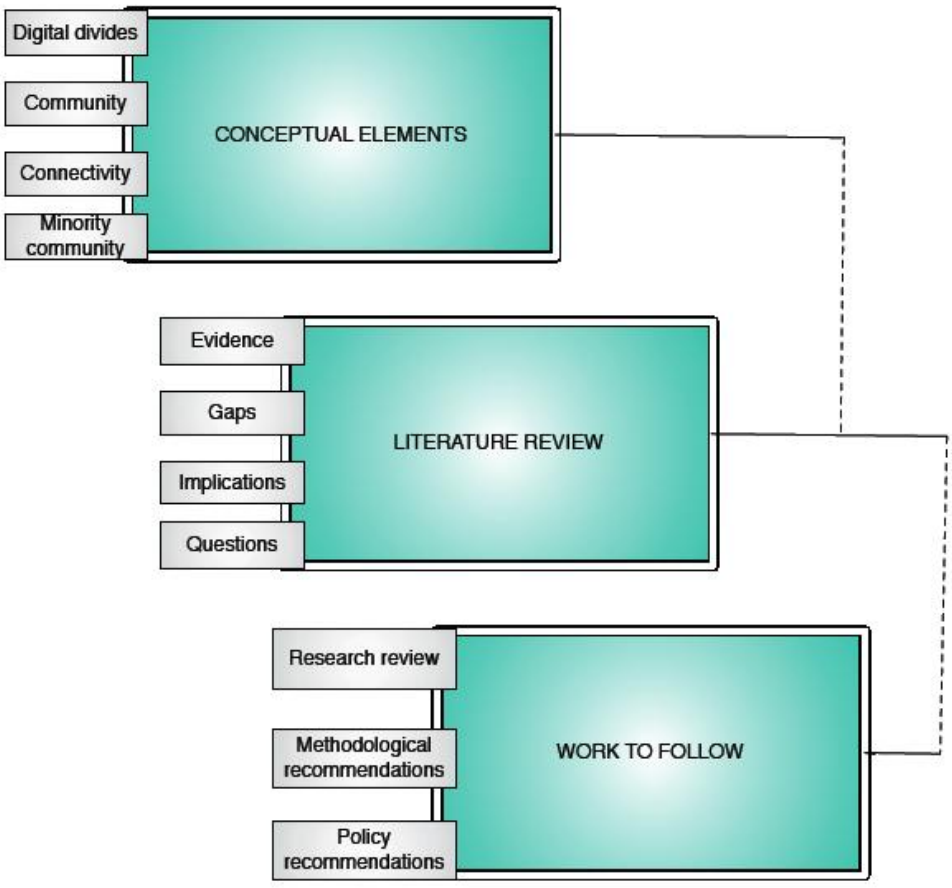
1.3 Literature review: conceptual foundations

The literature review provides a framework for the key concepts operationalised in the project and the space needed for these concepts to be discussed, clarified and properly placed in the context of

this work. Before we proceed with setting the scene for the key concepts discussed in this review, it is important to briefly define ICTs which constitute the core of this work. ICTs or Information and Communication Technologies, broadly refer to hardware and software that enables the synchronous and asynchronous production, processing, management, consumption and exchange of information and communication between two or more ends (e.g. individuals, groups, organisations etc). It usually refers to a wide range of technologies such as computers, the Internet, wireless networks, cell phones, and other communication tools. However, and as shown throughout this paper, most researchers and stakeholders in the field tend to identify ICTs with the Internet and therefore most of the literature identified actually focuses on Internet technologies. In the concluding part of this review we will report on how the research review to be conducted in the project will define and approach ICTs.

More specifically, as shown in Figure 1 below, the literature review stems from and rests on the key conceptual elements of the work. It aims to approach these elements through reviewing the relevant literature and identifying the available evidence and the apparent gaps in this evidence. As a result, the review raises implications and questions for the operationalisation of the key concepts in the work to follow.

Figure 1: Research map



First, it draws on the complex, ever shifting and multi-faceted concept of digital divides and broadly defines it as disparities in ICT connectivity and effective use which derive from related skills, knowledge and support inequalities. It casts some light on the importance of this concept for understanding social inclusion and integration of the general population and in particular highlights its explanatory power in terms of the relative socio-economic position of deprived or minority communities. It concludes by proposing a community approach to digital divides, thus linking this introductory discussion to the review of the concepts of community and (community) connectivity.

The literature review introduces the concept of community as the second key concept and illustrates its ambiguous and nebulous character which has led to a wide range of definitions and approaches. For example, 'community as tradition', 'community as a moral force', 'symbolic' or 'imagined communities' are some of the key approaches framing the concept in the relevant literature. In addition, 'virtual communities' has become an increasingly popular concept that has highlighted the role of ICTs in reshaping existing communities and providing the catalyst for the emergence of new community forms. 'Symbolic', 'interest', 'imagined communities' and 'virtual communities', all form a landscape for discussion which challenges conventional understandings of 'community connectivity', which is the third key concept of this review, and links connectivity to questions of digital inclusion and exclusion.

The concept of 'community connectivity' appears to be just as ambiguous and problematic as the broader concept of community. The discussion of the concept encompasses arguments concerning social and community cohesion, debates around the connectedness of communities, as well the key concept of social capital and the associated concepts of community networks, community life, social glue, social bonds, civic virtue, social ozone, community spirit, and others. 'Community connectivity' appears dependent on processes of bridging (inclusiveness) and bonding (exclusiveness) social capital, with different types of social capital performing contrasting roles in fostering connectivity *within* and *between* communities.

Finally, the review introduces 'interest communities' or 'minority communities', the fourth key concept of the work, and discusses, among others, the definition of the Commission for Racial Equality (which originally concerned ethnic communities only) that a minority community is a group of individuals that regard themselves, or who are regarded by others as a distinct community by virtue of certain characteristics that help to distinguish the group from the surrounding community. It argues that such community formations depart from traditional definitions of community and bring to the fore 'power' and 'connectivity' as key issues of concern, while posing the question how we distinguish minorities from the 'mainstream majority'.

This conceptual discussion highlights the importance of examining the role of ICTs in strengthening minority communities, enhancing their *within* and *between* 'connectedness' and in particular responding to their perceived problems of social exclusion and limited social or community cohesion. In conceptual terms, the review stresses that ICTs do provide a new focus for understanding bridging and bonding forms of social capital and thus for fostering connectivity *within* and *between* minority communities. This central conceptual argument essentially paves the way for the review of existing work on digital divides and minority communities and the introduction to the case study of Wales.

1.4 Literature review: structure

The review is structured as follows: first we introduce the concept of digital divides and debates around its conceptualisation and contextualisation; second we discuss the conceptualisation of community and community connectivity (and its related concepts); third we discuss ICT, minority communities and connectivity, effectively bringing the two strands of concepts which underpin the project (i.e. digital divides and community/community connectivity) together through an analysis of existing work on digital divides and minority communities; finally, the review introduces Wales and the issues it faces in terms of digital inclusion and community connectivity in particular. Thus the review is brought to a close with a concluding section which summarises existing evidence as well as persistent gaps in the examination of the role and importance of ICTs in the lives of ethnic/minority language and disability communities in particular. The conclusions highlight pending questions in the literature and the implications for the study of the Welsh context and argue for the need of a systematic review of existing research data if we aim to support new methodological and research approaches to the issues in the future, as well as to develop policy strategies that promote the use of ICT by particular social groups and disadvantaged communities.

2. DIGITAL DIVIDES

2.1 Discourses of scope, factors and effects

The digital divide has been defined as 'the divide created between those individuals, firms, institutions, regions, and societies that have the material and cultural conditions to operate in the digital world, and those who cannot, or cannot adapt to the speed of change' (Castells, 2002: p. 270). Van Dijk defines the digital divide as 'the gap between those who do and do not have access to computers and the Internet' (2006; p. 178). Norris sees it as 'any and every disparity within the online community' (2001; p. 4), while Wilson views this phenomenon as 'an inequality in access, distribution, and use of information and communication technologies between two or more populations' (2004; p. 300). However, the drivers which underpin the digital divide and its various impacts appear to reflect a far more complex phenomenon than can be inadequately understood in these relatively simplistic definitions. Increasingly the 'digital divide' – defined in its broadest sense - has been understood as being made up of many interlocking divides (OECD, 2000; p. 3). These 'interlocking' divides involve 'the multifaceted concept of access' (Hacker and van Dijk, 2003; p. 315) and that of use of digital technologies and ignite debates about the nature and scope of divides and whether to consider the social, economic, cultural, personal and political conditions in which digital technologies of information and communication (ICTs) are designed, developed and consumed.

What it is broadly acknowledged today is the need to depart from the old-fashion, conventional dichotomous split between 'haves' and 'have not's', and thus to turn attention away from pure numbers of people who access and use technology. Recent literature has suggested that variations in the use of ICTs can no longer be couched in the context of binary digital divides and that instead we should be exploring more nuanced, multiple levels of access, use and appropriation of ICTs to capture the role of technology in connectivity among individuals as well as within and among communities (Couldry, 2003; Livingstone and Helsper, 2007; Selwyn, 2004; van Dijk, 2006; Witte and Mannon, 2010). Understanding the quality of access and use of ICTs such as the Internet as well as contextual indicators are acknowledged as necessary for a systematic account of people's use and appropriation of technology.

An increasingly influential theme, as noted above, is the need to adopt a multi-level approach to understanding digital divides, for example, characterised by Selwyn (2004; p.351) as 'a hierarchy of access to various forms of technology in various contexts, resulting in differing levels of engagement of consequences'. In terms of access, Helsper (2008; p. 24) provided an empirical approach to analysing ICT access which synthetically examined location of access, quality of access (e.g.

broadband, wireless etc) and platforms people in the UK have access to. Bradbrook and Fisher (2004) support such an approach by arguing in favour of the '5 Cs' of digital inclusion:

- Connectivity - access and its various forms;
- Capability - skills and employability;
- Content - quality or community focussed content;
- Confidence - self-efficacy or motivation and;
- Continuity - continuous and on-going usage.

The 5 Cs highlight in particular the importance of the concept of 'self-efficacy', namely the 'belief that one can successfully perform a distinct set of behaviours required to establish, maintain and utilize effectively the Internet over and above basic computer skills' (Eastin and LaRose, 2000; p. 2). Individuals with low self-efficacy, for example, are less likely to be motivated to use the Internet in the future and confident about the benefits they can gain out of its usage in the long term.

Therefore in seeking to understand the complex phenomena of digital divides researchers have increasingly focused on 'complex questions of levels of connectivity in terms of the capability and distribution of the access concerned' (Selwyn 2004; p. 348), as well as effective usage of ICTs through requisite skills, knowledge and support (van Dijk, 2006). Thus a combination of access problems, lack of ICT skills and literacy or negative attitudes to ICTs can potentially provide a better picture of digital divides. Various categories of non-users, such as 'incapable refusers', 'self-conscious indifferents', 'the willing but incapable', 'skilled ICT lovers with limited access' and 'price-sensitive pragmatists' have been used to identify the nuances and variations in digital technology related disparities (Verdegem and Verhoest, 2009). In terms of delineating categories of users, a group of particular interest are 'restricted users' whose breadth of usage is limited and does not necessarily follow the fast development of ICT services and applications and especially those benefiting user learning, participation and interaction (e.g. Web 2.0 and developments towards Web 3.0). Such restricted use of the Internet and other ICTs might stem from the user's own will and conscious decision, as well as from low self-efficacy, limited skills or other access and attitudes parameters which can have diverse effects on usage experience and therefore on user's digital inclusion, engagement and development.

The major developments in the conceptualisation of digital divides described above are essentially progressions which flag up qualitative factors to account for divisions and explore into some depth the complexity of quality of use and its benefits for the user. In particular, there has been an increased emphasis on the importance of skills for the use of technology and relevance of technology to users' lives and interests (Selwyn, 2004, 2006; Bakardjieva, 2005). However, the key

arguments put forward by these various attempts to reconceptualise 'digital divides' have been questioned. Halford and Savage (2010), for example, have sought to go beyond the familiar idea of the 'digital divide' and develop a conceptual framework focused on digital social inequality. Their analysis draws on feminist theory, the sociological field analysis of Bourdieu and the Actor Network Theory, which all stress the role of fluid forms of relationality from which social inequalities can emerge as forms of stabilisation, accumulation and convertibility. What Halford and Savage (2010: p. 952) suggest are 'new perspectives and new tools which will enable us to go beyond established approaches to both technology and inequality and to find new ways of thinking, analysing and researching that get inside the complex and evolving nature of digital social inequalities'.

In terms of the key drivers of digital divides, research has consistently emphasised the influence of socio-economic and demographic factors. Although the central argument of these explanations have been questioned, for example, through an increasing focus on self-exclusion (Haddon, 2000) and resistance to digital technologies even in socio-economically and technologically developed countries such as the UK (Ofcom, 2004; Dutton et al., 2009), there is still evidence showing that socio-economics and demographic factors remain key factors in understanding digital divides. Reisdorf (2011) argues for the cases of the UK and Sweden that in the UK there is a more heterogeneous Internet non-user population than in Sweden, with socio-economic factors playing a bigger role in influencing who is going online in the UK than in Sweden. In both countries education, occupational status, and household income are identified as significant determinants of Internet adoption, with age and occupational status being the most important determinants. At the same time, Reisdorf (2011) finds that non-users mainly state they are not interested in the Internet and they share skeptical attitudes about the Internet.

Norris (2001) acknowledges that the broader dynamics of social disparities play a key role in shaping conditions of digital exclusion and questions the likelihood of overcoming such socially and economically engrained divides: 'even if the basic digital divide shrinks gradually over time, it is naïve to believe that the virtual world can overturn fundamental inequalities of social stratification that are endemic throughout post-industrial societies, any more than it is likely to overcome world poverty.' (2001; p. 17). Similarly, Castells (2002; p. 255) argues that deep social inequalities have marked the rise of the Internet and entailed long-standing differences in the role and use of the Internet in society (2002; p. 255). In recent years, such arguments have ignited a fundamental debate between optimistic and dystopian interpretations of the future of digital divides, although attempts to provide a more balanced picture, such as Katz and Rice's 'syntopia' (2002), have also emerged.

Traditionally socio-demographic factors, equipment and cost barriers have been seen as the main drivers of disparities in access and use of technologies such as the Internet (Rogers, 1995; Morrisett, 2001; p. ix; Angwin and Castaneda, 1998). However, even if Internet access is ensured, people may still not use it to the desired extent and with the desired results, as engagement is dependent not only on economic and practical parameters but also on socio-psychological ones (Selwyn 2004; p. 349). More specifically, factors, such as material resources and economic capacity, socialisation into the dominant culture, technical skills and awareness of the prevalent techno-culture, as well as social networks, are all forces shaping the phenomenon of digital divides (Selwyn, 2004; p. 352-5). Wyatt et al. (2002; p. 33-39) argue that other factors could be the 'potential gap between heightened expectations and the reality of the 'internet experience' or that 'all technologies are imbued with cultural significance'. Likewise, Stanley (2003) argues about the importance of non-cost-related psychosocial obstacles, such as relevance, fear and self-concept. Thus it has been argued that what it is actually needed in understanding complex, multidimensional digital divides is further investigation of the range of contextual factors, such as the social context of use and how this context affects people's capabilities, motivations, skills and willingness to use the Internet (Livingstone, 2002; p. 10).

As a result of the on-going attempt to conceptualise digital divides and define their scope, nature and causes, there has been a growing body of literature that has argued in favour of a more appropriate contextualisation of the phenomenon (Tsatsou, 2011a). More specifically, recent work has developed a top-down and bottom-up account of divides to demonstrate the role of social culture and decision-making in disparities in the usage of new media technologies in the West and South of Europe, the co-called Western-Southern divide (Tsatsou, 2011b). It is argued that this divide seems as a ladder of divides influenced by a complex set of socio-cultural and policy/regulatory factors. On the one hand, traditions, social backwardness, and aversion to risk impede the Internet's adoption in the South. On the other hand, openness to change, innovative and long-term oriented culture in the West has boosted the development of Internet technologies. In terms of decision-making, the development of the information society in the South has been impeded by the relative distance between leaders and followers and the highly centralised, backward-looking, security-seeking, slow and irresponsive to social needs character of decision-making. In marked contrast, the information society in the West has been driven by rich, timely, appropriate and innovative policies, even though critics have stressed the need for a more balanced treatment of civil/consumer and market interests in the information society in Western Europe (Tsatsou, 2011b).

Much of the literature and research focused on developing a better conceptualisation and contextualisation of digital divides has led many to raise questions as to why digital divides remain

important. It has been argued that the Internet is increasingly important to life, work, and play and 'even more important if certain groups and areas are systematically excluded' (Norris, 2001; p. 10). Communication resources, more generally, are imperative for providing information, enabling participation and for the exercise of citizenship, while social, economic and political exclusion can be exacerbated further due to digital exclusion (Cammaerts et al., 2003; Codagnone, 2009; Mansell, 2002; Punie et al., 2009). Access to the Internet is perceived moreover as 'a requisite for overcoming inequality in a society in which dominant functions and social groups are increasingly organized around the Internet' (Castells, 2002; p. 248). On the other hand, divergent evaluations of the Internet have made some to argue that 'maybe some people will not use it at all and – hard though it might be to accept – maybe its lack does not have to be a source of inequality and disadvantage.' (Wyatt et al., 2002; p. 25). From the same skeptical perspective, one can question whether it is digital divides creating social inequalities and disparities or the latter which pave the way for disproportionate digital opportunities to become available to people. Nevertheless, one cannot but consider the importance of equal opportunities for digital inclusion, as well as the effects of non-participation in the information society on both excluded individuals and social life. The literature largely argues that society as a whole pays the price of digital exclusion of parts of the population, as it becomes subject to what Katz and Rice (2002; p. 321) called 'digital balkanization'. Most studies argue that individuals who find themselves digitally excluded become socially and economically disadvantaged, as:

> The Internet and other communication and information technologies can enhance human capital by providing increased access to education and training. Information labour markets will prefer individuals who have both current and prior access to, experience with, and skills necessary for communication networks (Katz and Rice, 2002; p. 19).

2.2 Why a community perspective?

From a community perspective, the existing literature primarily addresses the question as to the potential role of ICTs in the revitalisation of communities and beyond the particularly optimistic views and predictions of the overall impact of what it is so-called information society (Lyons, 1998; Castells, 1996). Much of the debate is centred around the characterisation of communities today as social networks in crisis, impoverished, atomised, fragmented, with little trust and social bonds (Robson, 2000; Putnam, 2000). ICTs have been identified as offering the potential to encourage, facilitate and even revolutionise what has traditionally been seen as community and provide innovative networks of cooperation, inclusion, democratic decision-making and mutuality (Robson,

2000; p. 71; Etzioni, 1993; p. 6). In practice, ICTs offer the potential to expand the notion of community by strengthening existing offline communities and establishing new forms of virtual communities of interest, of attachment and of place in cyberspace (Wilmott, 1986). More specifically, ICTs can arguably contribute to community connectivity and consequent community revitalisation through a range of different mechanisms, including:

- Rebuilding and empowering offline communities (Benedict, 1991; Schuler, 1996; Communities Online, 1999). ICTs can play a key role in creating 'a reordered world where the individual can sample a community life that has long been eroded by the rush for individual gains' (Odone, 1995; p. 10). In this case, although communication is held online or via technological devices, the bridging of distances in offline spaces takes place with people associated with the same or different communities finding alternative paths of communication, information and initiative-taking.
- Through establishing virtual communities (Rheingold, 1993; Wellman, 1999 and developing 'digital neighbourhoods' (Negroponte, 1995; p. 7). Virtual communities can emerge at a variety of spatial scales from local-specific to global communities, reflect various interests and evolve in different ways. The nature of these communities challenges our traditional understandings of community.
- Finally, alternative forms of communities enabled by ICTs are the community computing facilities, 'venues stocked with computers and associated hardware and software where individuals can access ICT equipment and services' (Evans, 2004; p. 77-8). To this category also belong information points, where local and interest-specific information can be found by using computer-based technologies.

However, there seems to be limited literature evidence that consistently, systematically and thoroughly touches upon the dimensions, causes and effects of digital divides with regard to special community or minority groups such as disability groups and ethnic groups with language and other cultural attributes, as will be in detail discussed in the relevant section of this review. Such groups are usually approached from a commonsense socio-economic perspective, with the literature in field failing to consistently and adequately identify the ways in which they differ from other groups or the general population in terms of access to, usage of, and effectiveness of usage of ICTs as well as related skills, education and accessibility issues. As will be shown in the relevant section of the review, more discussion and work is needed to examine the barriers to effective use of ICTs and the consequent role of ICTs in connectivity of minority communities.

3. COMMUNITY AND COMMUNITY CONNECTIVITY

ICTs, disparities in their usage and appropriation and, consequently, their role in people's lives, are all to be examined in this project from a community perspective. The aim is to track existing research evidence and gaps so as to inform researchers and stakeholders about digital inclusion and the role of ICTs in the connectivity of communities in general and of minority communities in Wales in particular. However, a key challenge for any study attempting to operationalise the linked concepts of 'community' and 'community connectivity' centres on the potentially thorny issue of providing coherent definitions for these contested terms which reflect highly complex social and cultural phenomena. Indeed the Arts and Humanities Research Council's (AHRC) Connected Communities programme encompasses five research reviews focused primarily on exploring the conceptualisations and meanings of community, connectivity and linked concepts such as social capital.[1]

In addition a variety of related concepts focused on similar phenomena have emerged in both academic and policy debates in recent years. For example, multifaceted concepts such as 'social capital', 'social exclusion/inclusion' and 'social/community cohesion' have been operationalised in an attempt to enhance our understanding of the changing social, economic and cultural character of communities (Putnam, 2000; Halpern, 2005; Levitas et al., 2007; Forrest and Kearns, 2001). However, much like the overarching concept of community, each of these terms have been conceptualised in contrasting – at times conflicting – ways and therefore bring their own intellectual baggage (Laurence, 2011). Although it is beyond the scope of this literature review to provide an in-depth analysis of the conceptual development of 'community' and 'community connectivity', this section provides a brief introduction of the key debates and associated concepts.

3.1 Debates in the conceptualisation of community

[1] These projects funded as part of the Scoping Studies and Research Reviews Scheme include 'A Meta-narrative review of conceptualisations and meanings of 'community' within and across research traditions' (M Bertotti), 'Conceptualisations and meanings of 'community': the theory and operationalisation of a contested concept' (GP Crow), 'From 'Bridging Social Capital' to 'Co-operative Social Capital'? Mapping Emergent Connectivities across Communities' (DP McGhee), 'The changing nature of 'connectivity' within and between communities' (G Thomas) and 'Concepts and meaning of community in the social sciences: a review' (V Walkerdine).

The concept of community, Worley (2005; p. 486) notes, has commonly been identified as being a 'highly ambiguous and nebulous term, which needs to be treated with caution and care'. However, the concept of community remains highly influential in both academic and political debates. For example, the rhetoric of the community can be seen as a central pillar of the Coalition Government's commitment to the 'Big Society' and the previous New Labour government's approach to social policy (Cameron, 2010; Fremeaux, 2005). Bauman (2001; p. 1-3) argues that the continued resonance of community reflects 'the kind of world which is not, regrettably, available to us – but which we would dearly wish to inhabit and which we hope to repossess.' Although its influence has continued, the shifting nature of the concept over time and its contrasting use by social and political scientists, historians and philosophers has meant that its coherence and usefulness have been questioned (Delanty, 2003).

The varied approaches to interpreting community are highlighted by Delanty's discussion of debates around community and 'society' within modern anthropology and sociology. He argues that community has been conceptualised in three distinct approaches (Delanty, 2003; p. 31). Firstly, 'community as tradition' associated with Tönnies' (1963) classic distinction between Gemeinschaft (traditional, organic forms of community) and Gesellschaft (individual-focused, modern society). Secondly, 'community as a moral force' associated with Durkheim's (1964) rejection of Tönnies' critique of modern society and the key role of moral individualism in modern, civic forms of community. Thirdly, the emergence of the 'symbolic community' based on Cohen's (1985) argument that community should be understood more as a symbolic construct rather than as a social or institutional form. Similarly Anderson's (1983) identification of nations as 'imagined communities' suggests that community has more to do with common cultural identities and practices than day-to-day, face-to-face engagement. It is this latter characterisation of 'symbolic' or 'imagined communities' where a sense of community can be based on shared identity or common interests, and therefore may be geographically dispersed, which appears to provide a potentially useful starting point for understanding minority communities and community connectivity (Atherton, 2009).

An alternative approach to understanding the contrasting conceptualisations of community identifies 'weak' and 'strong' senses of community which diverge from the traditional nostalgic, romantic notion of community focused on tight-knit communities characterised by close social networks (Tyler, 2006). Tyler (2006; p. 23) argues that the first conceptualisation of community utilises the term as 'a synonym for people' – either broadly as an alternative to 'general public', in reference to inhabitants of a specific area or local populations benefiting from community development or regeneration. Tyler points out these forms of community are distinct from the close-

knit social networks that characterise traditional concepts of community but are essentially 'top-down'.

In marked contrast, 'strong' forms of community are centred on 'symbolic' or 'interest communities' and are therefore defined by participants within the communities themselves. Tyler (2006; p. 24) argues that in this form 'community is making a play for power', for example, through 'groups asserting identity, not on the ground of locality, but in terms of some form of common origin…or other shared, inherited characteristics'. In this latter sense 'community' moves beyond simply describing a group of people and is operationalised in terms of power relations. Delanty (2003; p. 46) notes that Cohen's concept of 'symbolic community' is defined by the 'particular kinds of awareness groups have of themselves in relation to other groups' and that the most significant kind of awareness is the symbolisation or construction of boundaries which differentiate a group from others. These 'strong' forms of community identified by Tyler and reflected in the concepts of 'symbolic', 'interest' and 'imagined communities' provide an interesting challenge in understanding 'community connectivity' – clearly the construction of boundaries or the identification of notions of 'them' and us' potentially raises important questions regarding the cohesion and 'connectedness' of different groups in society.

In recent years, an increasingly salient theme in the conceptualisation of community has been the role that technology has played in reshaping existing social relations and potentially providing the catalyst for the emergence of new forms of social relations. The discussion about technology and the way it influences communities actually involves the concepts of globalisation, cosmopolitanism and identity and illustrates how conventional processes of community formation are put into question by technologies through changing 'self', challenging 'individual identity', causing a 'play with identity' and creating a sense of 'connected identity'. Identity play, globalisation and cosmpolitanism give rise to arguments about a new community landscape where processes of mediatisation, deterritorialisation and imagination seem to prevail (Appadurai, 1997; Tomlinson, 1999).

Delanty argues (2003; p. 167), for example, that ICTs have 'created powerful new expressions of community that go far beyond all hitherto forms of community' and whereas in the past technology was portrayed as undermining community, ICTs have provided communities 'new possibilities for expression.' Delanty identifies three core strands of theory related to the emergence of these new 'virtual communities' centred on the work of Rheingold (1993), Castells (2002) and Calhoun (1992, 1998). Firstly, Rheingold's conceptualisation of 'virtual communities' is characterised as stressing the role of the Internet in providing 'an alternative reality to existing realities and as having the capacity to transform society' (Delanty, 2003; p. 173). ICTs are characterised as performing a positive role in

changing existing social relations and providing new spaces for social relations and communities which effectively do not exist 'in reality'.

Delanty (2003; p. 175-6) points out that this approach was critiqued by Castells, who rejected the separation of 'virtuality' and 'reality' and argued that 'the internet has a positive effect on social interaction, enhancing democratic possibilities and offering people a more communicative means of ordering their relations.' Crucially the Internet is characterised by Castells as part of a wider process where spatial communities have been replaced by social networks centred on the individual. However, Delanty (2003; p. 177-8) notes that a key feature of Castells' approach is the function that 'virtual communities' are able to play in bringing together networks of 'diverse people' and providing the opportunity for new dimensions of interaction. Wellman and Gulia (1999; p. 186) put forward a more nuanced view, arguing that

> people on the Net have a greater tendency to base their feelings of closeness on the basis of shared interests rather than on the basis of shared social characteristics such as gender and socio-economic status. So they are probably relatively homogeneous in their interests and attitudes just as they are probably relatively heterogeneous in the participants' age, social class, ethnicity, life-cycle stage and other aspects of their social backgrounds.

The potential role of the Internet in encouraging new social relations between diverse groups is rejected by Calhoun. He argues that 'the internet matters much more as a supplement to face-to-face community organisation and movement activity than as a substitute for it' (Calhoun, 1998; p. 382 quoted in Delanty, 2003). Therefore ICTs strengthen existing social relations rather than facilitating new networks of diverse people. Delanty (2003; p. 185) argues that Calhoun's more limited evaluation of the potential role of ICTs appears to have been born out in early research and that the Internet appears to 'empower community networks where these already exist but does not, for the most part, create new kinds of community'. However, key questions remain regarding the extent to which issues around social exclusion and community cohesion highlighted in traditional conceptualisations of community are reflected or indeed exacerbated within the context of multifaceted forms of digital exclusion.

3.2 Unpacking the concept of community connectivity

The concept of community connectivity appears to be just as ambiguous and problematic as the broader concept of community highlighted in the previous section. However, Rowson et al (2010; p. 1) note that 'the call for stronger communities is pervasive' and that 'politicians and people in every

walk of life seem convinced that communities can solve social ills and build a happier, more fulfilled society.' A key focus in terms of strengthening communities has been enhancing 'connectedness' within and between communities and in particular responding to the perceived problems related to social exclusion and promoting social or community cohesion (Levitas et al., 2007; Hudson et al, 2010; Worley, 2005; Gaffikin and Morrissey, 2011). Levitas et al. (2007; p. 25) draw on a wide range of definitions for social exclusion adopted by both academics and policy-makers to put forward a composite working definition:

> Social exclusion is a complex and multi-dimensional process. It involves the lack or denial of resources, rights, goods and services, and the inability to participate in the normal relationships and activities, available to the majority of people in a society, whether in economic, social, cultural or political arenas. It affects both the quality of life of individuals and the equity and cohesion of society as a whole.

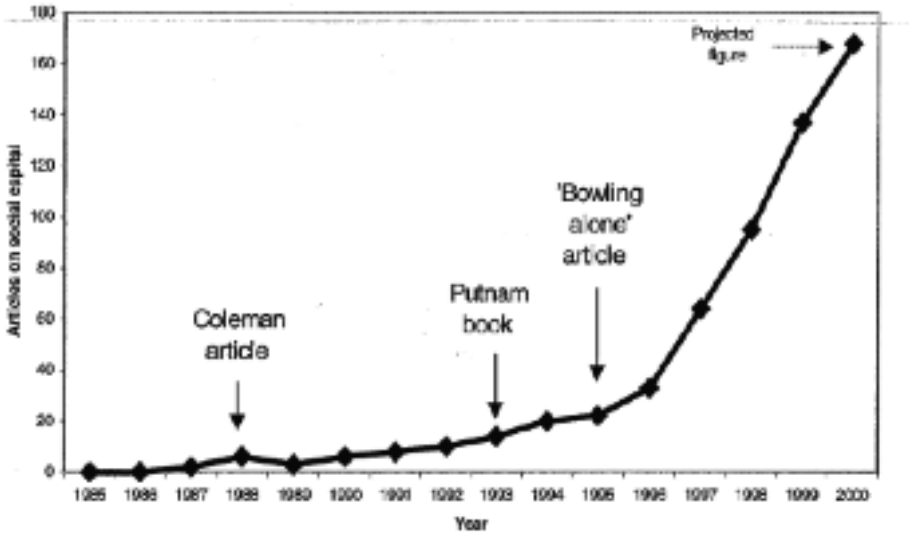
Drawing on this definition of social exclusion it is possible to potentially identify 'minority communities' or groups who are effectively excluded or distinguished from the 'mainstream majority' within society. For example, Pemberton and Mason (2007; p. 1440) note that Commission for Racial Equality (CRE) define minority ethnic communities as 'a group of individuals that regard themselves, or who are regarded by others as a distinct community by virtue of certain characteristics that help to distinguish the group from the surrounding community.' Similarly disabled groups, such as the 'deaf community', can be distinguished as having specific needs or interests which are different from the 'mainstream majority' (Atherton, 2009). However, as Edwards (2009; p. 616) notes, how the 'mainstream majority' is constructed and identified, particularly in relation to the contrasting needs and interests of minority groups or communities is potentially problematic.

The linked concepts of social and community cohesion have proven equally ambiguous and problematic to operationalise (Worley, 2005; Gaffiken and Morrissey, 2011). Kearns and Forrest (2000; p. 996) note that the discourse of social and community cohesion is underpinned by the concept of a cohesive society which 'hangs together' and 'all the component parts somehow fit in and contribute to society's collective project and well-being; and conflict between societal goals and groups, and disruptive behaviours, are largely absent or minimal.' However, Laurence (2011; p. 70-71) argues that in terms of ethnicity, two seemingly incompatible arguments have been put forward regarding the impact of diversity on social cohesion. On the one hand increased heterogeneity has been characterised as having a negative impact on trust and social capital within communities as 'higher diversity leads to a reduction in the total levels of network interconnectedness compared to

what they would be in a homogeneous community.' On the other hand, Laurence argues that in diverse areas 'what interaction and interconnectedness is occurring (although lower than in homogeneous communities) will more likely be interethnic in nature and thus drive improved interethnic relations.' Therefore whilst community interconnectedness may be lower in heterogeneous areas, that which does exist produces greater tolerance and cohesion. These debates have been primarily developed in relation to black and minority ethnic communities, and therefore there are question marks regarding the extent to which as concepts they provide much insight for other types of 'interest' or 'virtual communities'.

In recent years debates around the connectedness or cohesiveness of communities have centred on the increasingly popular concept of 'social capital' (See Figure 2). Halpern (2005; p. 1) notes that much like the concepts of community and social exclusion there is considerable confusion over what social capital actually means and that as a concept it tends to be defined in very loose terms and therefore 'sounds like everything and nothing.' Perhaps the most common definition identified within the literature is that put forward by Putnam (1993, p. 167) which defined social capital as 'those features of social organization, such as trust, norms and networks that can improve the efficiency of society by facilitating coordinated action'. Aldridge and Halpern (2005; p. 10-12) note that most forms of social capital have three key components: social networks which provide members access to information, benefits and support; social norms which are shared by members and provide rules around expectations of reciprocity, cooperation and trust; and sanctions which provide rewards and punishments for complying or breaking the agreed norms. Halpern (2005; p. 12) argues that the core elements can have both 'formal (explicit, institutionally codified) and informal (implicit, tacit) aspects.' However, the broad language used to refer to social capital - such as social energy, community spirit, social bonds, civic virtue, community networks, social ozone, extended friendships, community life, social resources, informal and formal networks, good neighbourliness and social glue – and the difficulties in measuring these processes have tended to add to the conceptual confusion (ONS, 2001).

Figure 2: The Exponential Growth in References to Social Capital in the Academic Literature, 1985-2000



Source: Aldridge, S. and Halpern, D. (2002) *Social Capital: A Discussion Paper* (PIU: London)

The concept of social capital, as noted above, has become increasingly popular with both academics and policy-makers but the development of the concept can perhaps most be associated with three key figures – Pierre Bourdieu, James Coleman and Robert Putnam (Field, 2003). Field (2003) notes that Bourdieu's work primarily focused on an analysis of the interplay between economic, social and in particular cultural capital. Crucially for Bourdieu (1986), much like economic assets, individuals are able to work to increase the value of their social and cultural capital and therefore it could be used to create and reproduce inequalities in society. However, Field (2003; p. 19-20) argues that Bourdieu's approach to social capital has a number of limitations, for example, it tends to overlook the potential downsides to social capital and focuses overly on elites and the individual, providing little room for groups and less privileged actors.

In contrast to Bourdieu, the conceptualisation of social capital by Coleman bridges both the individual and the wider collective and the privileged and disadvantaged. Coleman (1988; p. S100-101) argues that social capital is less tangible than financial, physical or human capital because 'it exists in the *relations* among persons'. Crucially for Coleman (1988: S119) where social capital exists, either as 'obligations and expectations' based on the trustworthiness of the social environment, 'information-flow' capability of social structures or 'norms accompanied by sanctions', actors are able to achieve mutually beneficial results. However, perhaps the most influential conceptualisation of social capital has been that developed by Putnam and it is his framework that provides the basis for the discussion developed in the rest of this section.

The concept of social capital articulated by Putnam, as noted above, centred on 'connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them'

(Putnam, 2000; p. 19). Importantly in Putnam's conceptualisation, social capital could be considered both a 'private good' (focused on individual benefits e.g. networking to get a job) and a 'public good' (focused on well-connected communities e.g. neighbourhood watch schemes). In addition, Putnam (2000; p. 21) argues that 'networks and the associated norms of reciprocity are generally good for those inside the network, but the external effects of social capital are by no means always positive'. Therefore the positive consequences of social capital – mutual support, cooperation, trust and institutional effectiveness – can be directed toward 'malevolent, antisocial purposes, just like any other form of capital' (Putnam, 2000; p. 22). In order to understand the different effects of social capital, Putnam distinguished between two principle forms: bridging (or inclusive) and bonding (or exclusive). Putnam (2000; p. 22-23) summed up this distinction by noting that:

> Some forms of capital are, by choice or necessity, inward looking and tend to reinforce exclusive identities and homogeneous groups...Other networks are outward looking and encompass people across diverse social cleavages…Bonding social capital provides a kind of sociological superglue whereas bridging social capital provides a sociological WD40.

These forms of social capital are not mutually exclusive in Putnam's framework and he emphasises that social networks cannot be easily divided between one or the other but may have elements of both across different social dimensions.

Putnam's distinction between bridging and bonding forms of social capital has been refined by Woolcock (2001 quoted in Field, 2003; p. 42) into three types:

1. bonding social capital, which denotes ties between like people in similar situations, such as immediate family, close friends and neighbours;
2. bridging social capital, which encompasses more distant ties of like persons, such as loose friendships and workmates; and
3. linking social capital, which reaches out to unlike people in dissimilar situations, such as those who are entirely outside the community, thus enabling members to leverage a far wider range of resources that are available within the community.

The key point highlighted by both Putnam and Woolcock reflects the potential contrast between the different roles of social capital in terms of fostering connectivity *within* and *between* communities. Aldridge and Halpern (2002; p. 33) note that 'high levels of bonding social capital relative to bridging social capital may adversely affect groups'. They argue that a possible explanation for poor labour market performance of ethnic minorities within Great Britain may be that although 'they have strong ties to their own families and communities (bonding social capital), they lack contacts or

networks with the wider community (bridging social capital) that could give them greater access to jobs and other opportunities.' Clearly the potential role of ICTs in creating 'virtual communities', highlighted in the previous section, suggests that the Internet could provide a new focus for bridging or bonding forms of social capital. Bell (2001; p. 110) notes, for example, that dealing with difference online is primarily about 'boundary-drawing' and that the 'compartmentalising the heterogeneity of cyberspace into 'neighbourhoods' of shared interests has become one important way in which communities are coalesced.' Communities or individuals identified as different are effectively 'bounded-out' from these 'virtual communities' or 'neighbourhoods'. In addition, if individuals, groups or communities are effectively digitally excluded – for whatever reason - this may simply reinforce traditional forms of social exclusion.

4. ICTs, MINORITY COMMUNITIES AND THE CONNECTIVITY QUESTION

Aiming to bring together the two strands of concepts which underpin the project (i.e. digital divides and community/community connectivity), this section reviews existing work on ICTs, minority communities and connectivity. It reviews work on ethnic minorities, particularly examining minority language groups that usually constitute part of ethnic minorities, as well as work on disability minorities. On one hand, this section identifies evidence that demonstrates the enhancement of the feeling and experience of 'connectedness' of minority communities through ICT take-up and appropriation. On the other hand, this section identifies evidence concerning the continuing digital exclusion of those minority communities.

Three types of barriers can be postulated as being influential in determining whether individuals go online: motivation, skills and access. Methods by which different facets of the digital divide can be measured are highlighted by researchers such as Vehovar et al. (2006). Largely studies have tended to investigate the latter so that, for example, maps of broadband infrastructure are increasingly being produced as part of regional or national atlases to identify gaps in provision with which to investigate geographies of demand, use and accessibility. Whilst access to the Internet is only one of many components to the study of digital exclusion, this has formed the basis for the majority of studies to date. As Lengsfield (2011) suggests, most quantitative studies of the digital divide are primarily concerned with access indicators as opposed to actual Internet usage and do not go beyond binary divisions between users and non-users to consider disparities in actual levels of Internet usage ('digital inequality').

The focus here is on what Lengsfield terms the 'domestic digital divide' focusing on inequalities between different social groups within a region or country in order to highlight any disparities and comment on their impact on 'connectedness' or 'connectivity' of minority communities. In addition, the emphasis here is specifically on previous research on digital divides and the Internet whilst acknowledging that there may be important contrasts with mobile phone access and the use of different technologies which may represent other aspects of the digital divide (see for example, Rice and Katz, 2003; 2005). Whilst there have many texts that include empirical analysis of the social inequalities surrounding the Internet within different sociological frameworks (e.g. Witte and

Mannon, 2010), the focus of the present review is on summarising existing knowledge on access and usage of the Internet within and between minority groups.

4.1 ICTs, ethnic groups and connectivity

Race, ethnicity and other associated socio-demographic indicators (e.g. religion, language, cultural values) are considered important to understand the benefits arising from ICTs for ethnic minorities which traditionally enjoy limited economic and social capital. For example, Brock, Kvasny and Hales (2010) contend that nowadays cultural capital is technologically mediated and that race and gender specific communication patterns and discourses are now spilled over to the Internet, thus becoming part of public discourses and visible in the public sphere. They argue that discourses which reflect racial, ethnic or gender sentiments are now possible through cultural appropriation of technology, something that challenges the need for deficit models of minority information and communication technology that arguably digital divide research is promoting. For instance, the case of ICT-enabled empowerment of ethnic minorities in France (e.g. Indian, Russian and Moroccan communities) shows the role of matrimonial websites in the facilitation of intra-community connectivity through intra-community marriages. It also demonstrates that the use of ICTs at Public Internet Access Points can boost the development of relationships of the ethnic community with and within the host country (Diminescu et al., 2009). In this regard, some have spoken about the emergence of the 'connected migrant' (Diminescu 2008), while ethnic diasporas have been greatly developed and expanded thanks to ICT-based communication which maintains the feeling of intimacy at distance: 'offers the opportunity to directly contact people who are on the move. Communicative mobility within diasporas is thus structured in a complex and highly differentiated way and depends on the appropriation of multifaceted media environments.' (Borkert, Cingolani, and Premazzi, 2009; p. 8).

Peeters and d'Haenens (2005) have argued that media technologies can encourage ethnic minorities get involved in a dual practice: that of bridging with the host country and that of bonding with the home country. Such processes essentially allow ethnic communities to maintain their ethnic identity, while accepting new identity elements and integrating themselves in the host country as publicly active, educationally skilled, digitally literate, productive and useful working members of the society in the host country. This balance was demonstrated in a Dutch school survey which found that youth attempt an integration-oriented and homeland-centred usage of media as determined by their religious, ethnic, national and cultural identity: 'youth and young adults – make more and more use of the Internet to acquire information about their countries and communities of origin, as well as about Dutch politics and news about the Netherlands.' (d'Haenens, 2003; p. 419). Other empirical

work demonstrates how immigrant or diasporic communities (e.g. Indian communities) are formed, developed and evolved in cybernetic space, thus enhancing the sense of belongingness of their members (Mitra, 2003, 2005; Skop and Adams, 2009). In this sense, the concepts of 'diasporas' and 'global diasporas' (Clifford, 1994; Cohen, 1997) acquire a new substance through online diasporic community spaces. Such spaces form a 'diasporic public sphere' (Appadurai, 1997) which negotiates and connects the real and the virtual and illustrates the way the Internet challenges 'individual identity' and creates 'connected identity' or what has been famously called 'virtual ethnicity' (Poster, 1998) and 'long-distance nationalism' (Anderson, 1992, 1998).

On the other hand, ethnicity and its linkages to other socio-demographics form a discussion that sheds light on possible difficulties and/or barriers to fully advantageous take up and usage of ICTs. A recent Joseph Rowntree report (JRF, 2011) provided a review of the linkages between poverty and ethnicity and explored the types of influential factors and issues that need further investigation. One of the key gaps identified to support action against poverty concerns the use of Internet and Web 2.0 technologies to promote online interaction within ethnic communities. However, the report also highlighted gaps in data availability in this area, concluding that 'it would be useful to know more about how ethnicity and other factors affect people's access to the Internet and their willingness to use such services' (JRF, 2011; p. 12). Lengsfield (2011) draws attention to the lack of cross national studies that focus on such individual usage behaviour as opposed to access data such as connectivity, hardware, etc.

At the same time, there have been a number of studies that have used spatial analytical and visualisation approaches including GIS to analyse geographic variations in the availability of broadband services (Cai, 2002; Grubesic and Murray, 2002; Sawada et al., 2006; Grubesic, 2010; Oyana, 2011). Often these are used as part of larger studies concerned with examining supply-side infrastructure characteristics (e.g. areas without broadband provision or with speeds of Internet service) in relation to demand-side data in order to investigate potential reasons for non-adoption. Greenbrook-Held and Morrison's (2011) study of access to the Internet in New Zealand, for example, used data on household Internet connection from the New Zealand Census to suggest that socio-economic and demographic factors accounted for much of the spatial variation in access. Again the focus here is on access within the household, rather than actual use of the Internet which, together with speeds of connection or types of on-line activity (Michailidis et al., 2011), is not routinely collected. Of particular significance was the finding of lower than expected rates amongst the Maori and Pacific Islanders communities, emphasising the importance of ethnicity as an explanatory factor in the 'domestic divide'. This remained the case even after controlling for age, gender, income and educational levels of users suggesting that 'the influence of ethnicity on domestic Internet access

remains marked and highly significant statistically' (Greenbrook-Held and Morrison, 2011; p. 26). This, the authors suggest, contrasts with the case in other contexts (such as Europe) where much of the explanation for geographical variations can be related to differences in socio-economic characteristics and income gaps (Vicente, and Lopez, 2011). Interestingly Greenbrook-Held and Morrison's (2011: p. 35) comparison of home Internet access between urban and rural areas led them to suggest that 'while there remains a geography to Internet access that could reflect supply constraints, the influence of supply factors appear to be relatively minor compared with the role played by socio-economic and ethic attributes of individuals themselves'. This would suggest therefore that, at least in the context of Internet access in New Zealand households, 'the geography of Internet access appears primarily a reflection of variation in domestic demand...than locational constraints exercised by suppliers' (Greenbrook-Held and Morrison, 2011; p. 36).

There is conflicting evidence in the literature regarding the significance of ethnicity as explanatory factor influencing variations in Internet access (Novak et al, 1998; Baker and Coleman, 2004; Eamon, 2004; Whitacre, 2008). Eamon's analysis of digital divides, for example, involved a survey in the United States of self-reported computer access and use amongst just over a thousand 10-14 year olds and found that differences in home computer access between whites and African Americans and Latinos 'remain...even after controlling for poverty and other demographic factors (e.g. mother's marital status and educational level)' (Eamon, 2004; p. 108). However, Eamon argues that more research is needed to explain such variations in terms of poverty or perceived attitudes regarding the benefits of computer technologies and to extend the research to other groups, ages and technologies. Hoffman and Novak (1998), for example, found that variations in household income helped explain differences in home computer access between whites and African Americans but that 'after statistically adjusting for education, the differences between whites and African Americans in home computer ownership persist.' Baker and Coleman (2004) found that income was the biggest predictor of computer and Internet usage in their study of Detroit. Other factors such as education, age, employment status and the location of the residence within the city were also seen as important influences on the use of the Internet at home; but race was deemed a 'secondary determinant'. This led the researchers to suggest that 'the digital divide that exists in Detroit is not primarily structured by race; rather, it is structured mainly by income, education, age, and work status' (Baker and Coleman, 2004; p. 265). A study of neighbourhood variations in Wi-Fi access (using access point mapping in Baton Rouge, Louisiana) revealed that "low-income household headed by a black, single, female parent with multiple children and no college degree have the lowest rates of Wi-Fi ownership" (Driskell and Wang, 2009; p. 35). However, the authors suggest that "income was less significant than most of the other socio-economic and demographic

variables....race, an attribute with no inherent inhibitors to technology adoption, is more closely associated with Wi-Fi ownership" (Driskell and Wang, 2009; p. 43). This, it is proposed by the researchers, is related to differential lifestyles and hence demands for Wi-Fi and associated technologies between white and black populations but they suggest that more (qualitative) research is needed to explain patterns of non-adoption.

Others have explored disparities in use of the Internet between school age children using individual and family characteristics, household computing resources and school resources and found that differences can be explained both by the availability of computer resources and the presence of adult users of the Internet within the household (Cleary et al., 2006). Such studies encompass a wider range of factors both inside and outside the home and enable a wider perspective on the types of influences on Internet use beyond the demographic characteristics of individuals, the socio-economic patterns in deprivation of communities or areas which are traditionally investigated. Nevertheless even in this study findings from a logistic regression analysis suggested 'that the odds of school age children in households with a Black non-Hispanic or Hispanic reference person are significantly less likely to use the Internet than children from households with a white reference person' (Cleary et al., 2006; p. 367). This disparity reduced when more explanatory variables were incorporated in the analysis highlighting the importance of factors such as family educational, financial and computing resources.

The need for quantitative studies to control for those potentially confounding variables influencing Internet access has, in turn, drawn attention to the limitations of existing surveys and datasets in fully exploring the impacts of ethnicity. Such studies can complement their findings from qualitative studies that have explored in more depth the factors that can lead to the adoption of broadband. Powell et al. (2010), for example, used such an approach to look at barriers to ICT adoption in the United States amongst low-income communities through interviews with non-adopters. Owen et al. (2003) undertook a project on the use of ICT by people from Black and Minority Ethnic (BME) communities living in deprived areas for the Department for Education and Skills which involved a MORI household survey which included qualitative interviews in Birmingham, Cardiff, Bradford, London, Glasgow and Leeds. The authors highlighted a paucity of research related to ICT access and usage amongst such communities but used a statistical analysis of the household survey to identify key predictors of ICT access and use for those groups specifically living in deprived areas. This found variations in awareness of certain technologies and, controlling for factors such as household type and income, that being Black was 'a significant predictor of lack of PC ownership' (Owen et al., 2003, p. xiii). Relative economic position and in particular unemployment were also important predictors, as were income level and factors such as number of children in the household. Many of the barriers

to the use and ownership of PCs were also followed up in this study and included a lack of computer literacy, problems with fluency in the English language, gender issues in some communities and a lack of interest in using such technologies. Overall their study concluded that whilst factors such as age, household structure and income did influence levels of ICT access and use, ethnic group was also a factor which in turn was related to computer literacy and language. However, there were important variations within such groups which the authors suggest are worthy of further study, for example, the case of south Asian Muslim women. More recently, an Equalities and Human Rights Commission report (EHRC, 2010; p. 369) suggested that for Britain as a whole variation in the usage of the Internet by ethnicity was less significant than by age or social class. However, as suggested in this EHRC report (2010), there is a distinct lack of data on the use of the Internet by ethnic groups (ONS, 2009). Often in such studies, Internet use is proxied by Internet access. Nevertheless the EHRC report draws on a Media Literacy Audit Report (Ofcom, 2008) to note greater access to the Internet and greater use of the Internet by some ethnic groups such as Indians over the age of 45 (see Jones, 2010).

The Australian Census of Population and Dwellings also permits an analysis of the use of the Internet but unlike the New Zealand census extends to access at places of employment (Gibson, 2003; Willis and Tranter, 2006). Such studies tend to confirm the importance of factors such as household income, age, education and class as being key to explaining spatial patterns in differential Internet use. A key issue arising from such studies involves the need to establish the potential role of factors such as ethnicity over and above that of such socio-economic circumstances. Unlike the census in Australia, the UK census cannot be used to provide spatially and temporally consistent data on access to the Internet and so researchers such as Longley and Singleton (2009) have used innovative techniques to provide a spatially disaggregate approach to identifying links between digital (un)engagement and multiple deprivation. Drawing on a geodemographic classification they suggest a linkage between engagement and material deprivation but highlight a number of anomalies which they suggest may be due to factors such as lack of confidence, IT skills or the types of motivation factors highlighted in previous qualitative surveys. However, their study was confined to England and more research is needed to see if the association between social and digital inclusion are replicated in Wales.

Regardless of the above research insights, it still seems that the study of ICTs in the field of ethnic or immigrant studies is fragmented and limited: ‘‘there is a lack of empirical knowledge on the shaping of information networks and the use of information and communication technologies in migration contexts.’ (Ros et al. 2007, p. 4). Further understanding of the internal dynamics of ethnic communities is needed and more consistent and longitudinal evidence of the take up and

appropriation of ICTs by a continuously evolving and culturally complex map of ethnic groups is also needed. Reviews of European research in the field identify theoretical and methodological shortcomings in research, such as the ignorance of the cultural and social specificities among the users of ICT who experience migration. More user and impact analysis is suggested in this regard, while comparative and theoretically elaborated work is encouraged (Borkert, Cingolani and Premazzi, 2009; p. 23). Such evaluations of existing literature suggest more focus on: the new 'connected migrant' – the role of synchronicity of local and long distance connectivity in ethnic minorities' lives - the role of ICTs in the physical and communicative mobility of ethnic groups, the 'emerging information migration society', the shift of power relations which dynamically alters the role of ethnic and migrant communities in the host countries, the economics of ICTs in ethnic communities, and how migrant entrepreneurs are faced with new business opportunities and a new labour market in the host country (Borkert, Cingolani and Premazzi, 2009; p. 23-24).

4.2 The role of language[2]

At this point the review attempts to critically discuss the role of language in ICT adoption and connectivity of ethnic minorities since there is high correlation between ethnic and language identity and therefore minority language groups are usually identified with specific ethnic communities (with the exception of minority indigenous languages in population groups with the same ethnicity, for example, first Welsh speakers within Wales and UK). This is to say that by examining minority language groups one is likely to report findings which broadly correlate with those reported for ethnic minorities in the same region. Language is a pretty clear, distinct and also tangible element of an ethnic community's identity and practices – contrary to other less concrete identity elements such as lifestyle and culture – and also an element which has been examined to an extent from an ICT and connectivity perspective.

However, one needs to consider the difficulty in defining minority language groups and categorising their language skills (e.g. oral, speaking, writing skills). Members of a minority language group (i.e. group whose main language is not the official or main language of a region) might still be able to use the official language as well as other languages, with members of the group presenting diverse

[2] As 'language' is considered here one of the identity elements forming the particular needs of ethnic communities and thus minority language groups are considered a sub-category of ethnic communities, the discussion of work available in this area is far from exhaustive. This section discusses work which indicatively refers to ICT enablers of inclusion and connectivity enhancement for minority language groups as well as to relevant barriers and risks of exclusion, without, however, providing an exhaustive and detailed account of such work.

language skills and therefore diverse opportunities to be connected with the official language system in the region where they reside. In this review we cannot solve this difficulty; however, we attempt to discuss and evaluate some of the barriers and connectivity opportunities that particular minority language groups are subject to when they adopt ICTs, so that we enrich and possibly inform further the review results obtained for ethnic groups.

The exact role of the Internet on the survival of minority languages has been the subject of a great deal of debate. Bianco, Cunningham and McCombe (2009) raise the general risk of social isolation of minority language groups in Australia, while considering the potential social empowerment and inclusion encouraged by ICT take-up. On one hand, the authors point out that language specific groups have the opportunity to engage in language learning, information, cultural maintenance and communication by using the Internet, they can themselves create their own language resources and tools which are not available through traditional communication channels, and also they can engage in language-specific oral and written communication through the use of multimedia and Web 2.0 technologies. Thus they confirm in a way the prediction that Crystal (2000, p. 141) made more than ten years ago about languages in danger: 'an endangered language will progress if its speakers can make use of electronic technology'. In addition, minority language groups have the opportunity to communicate with other language groups across space and time – usually as part of broader communication patterns that involve ethnic, religion or other culture-specific exchange – and to share information and heritage, while being offered online or technologically-mediated language learning and training which can even make them part of the 'mainstream' language community (Bianco, Cunningham and McCombe, 2009; p. 6). In this way, online communication produces new cultural objects to be stored, displayed, and circulated, and develops new forms of 'sociality' sustained by the creation and exchange of such electronic artefacts, with language revitalization being often linked to claims of ethnolinguistic recognition (Eisenlohr, 2004).

Case studies of empowerment of endangered languages (i.e. languages spoken by a minority of the population, but not necessarily languages spoken by ethnic minorities *per se*) show that appropriate usage and appropriation of ICTs can actually lead to revitalisation of a language spoken by a specific or particular population group in one or more locations. For instance, a study of Aragonese, a language spoken in the northern area of Aragon by a population of about 10,000 speakers, has shown that the creation of reference sites, online communities, websites and blogs about Aragonese, as well as the creation of audiovisual archives, encyclopedias and emerging software localization projects for this language constitute important tools to 'give visibility and prestige to the language and to enhance its use and promotion on the internet, which may beneficially reverse the real-world situation of the language.' (Paricio-Martin and Martinez-Cortes, 2010). Also, studies of

other endangered languages, such as Mohawk (Bittinger, 2006), Welsh (Cunliffe, 2009) and Hawaiian (Gala, 2009) provide showcases of usage of the Internet for language learning and dissemination, discuss relevant community initiatives and argue about the overall potential of new technologies to preserve endangered languages which are spoken by a minority of the population through social, learning, information and multi-media software and content (e.g. Wikis, electronic libraries, electronic dictionaries with audio function, search engines, websites, social networking sites, blogs, discussion boards, audio video conferencing, instant messaging etc).

On the other hand, although Warschauer (2002) identified early on some linguistic diversity on the Internet, he considered it to be indicative of the social struggle of individuals and communities to construct and express their identities online. For example, the Australian study by Bianco, Cunningham and McCombe (2009) confirms the existence of barriers to ICT access and use by minority language groups. This study refers to barriers related to the lack of access to resources in the group's own languages, as well as technical problems concerning how computers and web browsers manage language scripts. More specifically, it argues about the importance of Unicode compatibility, the localisation of navigation tools available on language-based websites, the importance of people accessing keyboard layouts in their language, and the significance of access to equipment and software as well as to training that is culturally sensitive and economically affordable (Bianco Cunningham and McCombe, 2009; p. 6). From a less technical perspective, this study raises the importance of accessibility, suggesting that government and commercial services, information and forms should become available online in all used-in-the-region languages to fully take advantage of all the opportunities technology offers for increasing participation, engagement and integration of language groups (Bianco Cunningham and McCombe, 2009; p. 9). Finally, it argues that language specific groups need further training and support to build community-based websites that use linguistically and culturally appropriate infrastructure and tools. Thus it is suggested that such groups need support in order to establish community-based venues where they could provide Internet and multimedia facilities and training to empower and teach themselves into how to create linguistically and cultural tailored resources (Bianco Cunningham and McCombe, 2009; p. 9). Along these lines, studies looking at languages at risk due to 'Anglicization', modernisation, historical ignorance and the dominance of a politically approved and officially established language reach similar conclusions. They point out the ongoing problems in the fully advantageous usage of technology for language revitalisation and propose community, education and state initiatives in order to overcome accessibility, usability and training barriers and to encourage the creation of online linguistic resources and software localization, the normalization of use of the language on the Internet, and

educational and outreach activities online (Gala, 2009; Paricio-Martin and Martinez-Cortes, 2010; Wright, 2004).

In the UK, reports have shown that language barriers (i.e. language other than English) obstruct people from becoming digitally and therefore socially included, essentially constituting barriers which are inextricably linked with other socio-economic and ethno-cultural traits of the groups in focus (Department for Communities and Local Government, 2008). Cunliffe (2007; p. 134) suggests that because patterns of digital exclusion tend to mirror those of patterns of social exclusion in general, areas with a greater percentage of minority language speakers, subjected to high levels of social exclusion, could also be expected to be associated with higher than average levels of digital exclusion. As recognised by Cunliffe, the likely interaction between language use and other social variables such as income and age, suggests however that there may be important contrasts *within* communities of minority language speakers however spatially defined.

On the other hand, Diminescu et al.'s (2009) report on minority communities and ICT in France concludes that regardless of the public programmes, initiatives and institutions in place to develop wide social use of ICTs, especially use of public online services, only few fully transactional services exist for minorities with particular language needs and attributes. Also, it finds that specific eGovernment services with multi-language information, simplified language and guidance which are needed for language minorities in the country are not yet sufficiently developed. The authors suggest initiatives that foster linguistic diversity and the systematic cross-referencing of all local government websites to the central service-public portal so as to facilitate the understanding of French administrative language and procedures. To resolve similar language barriers in the South African context, Barnard, Cloete and Patel (2003) examined usability issues when a spoken (telephone-based) interface is used to deliver e-government services. They developed two test platforms (User interfaces using DTMF – keypresses - and speech recognition) and suggested technological interventions which will enable better electronic service delivery for those faced with cultural, language, literacy and limited technological experience difficulties in accessing and using technology.

Nevertheless, the above picture of ICT enablers and barriers for minority language groups is compromised by the relatively limited and fragmented evidence in existence. There is essentially not sufficient work that maps out in a coherent and analytically rich way the 'connectivity' or 'connectedness' benefits that minority language groups can gain from using ICTs. Work in the field seems to be lacking deep examination of areas that shed light on how ICTs can increase connectivity of groups speaking a language other than the official language and enable those groups become

integrated into the public communication system of the country of residence. In addition, the evidence available is often placed in a broader framework of discussion and work concerning ICTs in ethnic, immigrant or other minority contexts, thus not always providing a clear and consistent focus on the role and importance of 'language' *per se*. Finally, research work and evaluations of the importance of ICTs for minority language groups needs to go beyond narrow statistical and numerical approaches to linguistic diversity on the Internet and ratings of languages that exist online (Pimienta, Prado and Blanco, 2009). More attention has to be paid to what language really does on the Internet and how it influences, if at all, the user who makes use of it online.

4.3 ICTs, people with disabilities and connectivity

Moving on to the group of people with disabilities[3] one can acknowledge that some literature has been concerned with the range of individual, community and policy factors which can facilitate ICT access for people with some disability (e.g. Jacko and Vitense, 2001). At the same time, there have been voices raising the problematic nature of such a discussion and questioning the concept of disability itself: '…disability, itself, is clearly a contested term, often defined against a norm of ability hence seen in terms of deficit.' (Adam and Kreps, 2009; p. 1045). Also, there have been voices asking why to care.

According to UNESCO, more than 10% of the world's population suffers from various disabilities running the risk of social and community isolation. ICTs offer to people with disabilities 'the ability to compensate for physical or functional limitations, thus allowing them to enhance their social and economic integration in communities by enlarging the scope of activities available to them'.[4] For instance, disabled individuals can benefit through participating in distance learning programmes available online, through engaging in mobile video communications and distance education in sign language (important for deaf people), as well as through taking advantage of Web 2.0 services and application which provide flexibility with regard to the body abilities required (e.g. audio, visual or textual) (Muhammad, 2008). Also, Söderström (2009) acknowledges the importance of online support groups and disability-related networks on the Internet for empowerment of adult disabled people, while she finds that ICTs also contribute to the extension and globalisation of disabled youth's networks which, however, do not build on disability or disability-related issue while providing disabled youth with an escape from stigma and isolation.

[3] In the category of people with disabilities we include people with physical, cognitive, mental, sensory, emotional or developmental impairment.

[4] http://www.unesco.org/new/en/communication-and-information/access-to-knowledge/access-for-people-with-disabilities//

However, Baker et al. (2009; p. 48) suggest that 'statistics reflecting access to the internet and use of computers by people with disabilities is sparse'. The fairly limited research that has been conducted to date highlights the key differences between accessibility and usability of technologies and the types of factors that are likely to influence the adoption of a range of ICTs. In this review we draw attention to the need to recognise the importance of adaptations of tools to meet the needs of a range of disabled groups in society and to widen the use of such technologies. This includes, for example, more guidelines to promote access of Internet within and between such groups (e.g. Poulson and Nicholle, 2004) as well as a whole host of software and hardware adaptations.

Regarding the adoption of ICTs, several studies investigate the diversity of barriers (e.g. policy, perceptual, skills, technological, financial etc) to online experiences that people with disabilities are faced with (e.g. Hollier, 2007; Vicente and Lopez, 2010). Others are concerned with issues surrounding the adoption of wireless communication technologies by such groups (Baker and Moon, 2010). Others raise the importance of psychological barriers and the need to overcome disabled people's fears that they lack the skills and confidence to use ICTs as appropriate through the provision of training and affordable assistive technologies (Boeltzig and Pilling, 2007; p. 44). Others provide a critique of existing policy documents and the new UK government's E-accessibility Action Plan (BIS, 2011) that promotes enhanced digital participation within the UK, but lacks discussion of how such technologies will impact on people with disabilities (Watling, 2011). This, in turn, points to the increased 'need for barriers to disabled people using access technology to be highlighted and addressed' (Watling, 2011; p.492); some of which were highlighted in a previous government commissioned research project (CEG, 2009). Other studies are concerned with the implications of new technologies such as Wi-Fi on the so-called 'disability divide' (Baker et al., 2009). However, others suggest that 'accessibility for people with disabilities has been frequently neglected by the ICT industry' and that 'as a result, the level of computer usage and Internet access by people with disabilities is much lower than that of the rest of the population' (Vicente and Lopez, 2010; p. 48). This is also related to current policies implemented in the field, as it has been found there are gaps in engagement of disability discourses with disabled groups lacking engagement with the dominant policy making agenda, thus suggesting that disability activists are included in the decision-making process concerning the web accessibility movement (Adam and Kreps, 2009). This has led some to argue about 'digital disability' and social constructions which make us to think that 'not only that technology will never deliver society from the reality of disability, but that disability continues to be constructed through that technology.' (Goggin and Newell, 2003; p. 153). Or, according to Moser (2006; p. 373): '…technologies working within an order of the normal are implicated in the (re)production of the asymmetries they…seek to undo'.

Pilling et al. (2004) focused on the impact of the Internet on people with disabilities at a time when increasingly more and more government and commercial services are moving on-line. As part of their Joseph Rowntree funded research they reviewed previous literature in this area focusing on the types of barriers which limit use of the Internet amongst such groups prior to implementing a questionnaire, which gathered together views from disabled people who had used the Internet as well as non-users, and holding focus groups. Their review concluded that 'direct information concerning Internet usage by disabled people in the UK is scarce' (Pilling et al., 2004; p. 4); nevertheless they drew attention to a number of surveys that found that ownership of computers, and home access to the Internet, was lower for people with disabilities than non-disabled adults. For instance, Ofcom found in 2006 that home Internet access was lower for people with disabilities under the age of 65 (50 percent) than for all adults in this age group (62 percent), and that for those over 65 it was also lower among those with a disability (15 percent), than those without a disability (27 percent).

These trends mirrored those found in previous studies of the use of the Internet in countries such as the United States, with studies drawing on survey information from the US Census bureau to suggest that such differences were explained by economic and demographic factors, and China (Guo et al., 2005). At the same time, the 2002 Pew report (Lenhart et al., 2002) and the Dobransky and Hargittai (2006) survey found problems that obstruct people with disabilities to use the Internet that relate to poor accessibility of places where there is Internet access in the community, difficulties in actual usage and high cost of assistive technologies needed by people with disabilities to use the Internet. Pilling et al., (2004; p. 19) suggest that 'there is no evidence from the UK of the extent to which the disadvantage arises from age, or from being disabled, or whether all age groups of disabled people are equally disadvantaged'. Their in-depth questionnaire investigated how the Internet was being used by such groups and the barriers to use for some activities. Whilst many of the issues that arose were common to the general population e.g. concerns over security, cost of access, and motivational issues, there were concerns that are likely to be more prominent for disabled Internet users (e.g. physical strain, adaptation costs). The types of factors that influence the decisions by people with disabilities to adopt or to abandon such technologies are explored in more detail by Seymour (2005).

There is conflicting evidence internationally on the trends of ICT access and use for people with disabilities. Research from the United States has, for example, explored the extent to which people with disabilities are engaging with the Internet and how their use compared to that of the general population (Dobransky and Hargittai, 2006). This study has drawn on nationally representative survey data for 2003 to tease out the importance of confounding factors such as age, gender and socio-economic status on Internet use using logistic regression. Their results suggest that 'people

with disabilities are less likely to live in households with computers, are less likely to use computers and are less likely to be online' (Dobransky and Hargittai, 2006; p. 313). At the same time, they find that Internet users with disabilities are more likely to search information online and resort to government websites than those without disabilities, but hey are less likely to use websites to download and submit forms and conduct relevant transactions since this requires better resources (e.g. additional software) and a more advanced know-how of Web use (Dobransky and Hargittai, 2006; p.329). They compare their findings to previous research in the US (e.g. Kaye, 2000) that, whilst finding less access to computers and the Internet for people with disabilities, note a dampening down of this effect for those disabled individuals with higher incomes.

Vicente and Lopez (2010) draw attention to the importance of a multi-dimensional approach to understanding potential differences in accesses and usage. In particular they highlight the importance of affordability, attitudes, usage of the Internet and on-line patterns. Drawing on the European Commission's IST Program project eUser (2005) of use and uptake of online services as well as attitudes to ICT in ten European countries, the researchers found that only 35% of those who recorded themselves as disabled used the Internet as compared to 61% for those without impairment. The lower incomes of people with disabilities as well as higher costs involved in purchasing adaptive technologies were seen as important explanatory factors here with 58% of those interviewed in the eUSer survey that had a self-reported disability suggesting that the high costs involved acted as a deterrent to having a home connection. Other factors that were important included the extent of negative feelings towards the use of the Internet (almost double that for those people with disabilities compared to those with no impairment) and heightened concerns regarding Internet security. Thus even after controlling for factors such as socio-economic characteristics (education, income, employment status), people with disabilities are less likely to use the Internet suggesting that 'while socio-economic factors play a role in the lower levels of use of the Internet, they do not explain the discrepancies on their own' (Vicente and Lopez, 2010; p. 59). Thus factors such as technical accessibility and feelings of intimidation are likely to be important here leading them to conclude that accessibility and affordability are two key issues for policy makers to address in bridging the divide. Such findings mirror those of Dobransky and Hargittai (2006; p. 327) who suggest that:

> …there is an independent effect of having a disability on the likelihood of being an Internet user. When controlling for characteristics such as education, income and employment status, people with disabilities are still less likely to be making Internet use a part of their lives. Even among those with higher socioeconomic status, having a disability constitutes a barrier to using the Internet.

However, their analysis of Internet use by type of disability suggests that after controlling for confounding factors this apparent 'disability divide' declines for some disabled groups leading the authors to suggest that for some conditions, which potentially limit use at the keyboard, 'technological barriers' could be important factors on whether people go online. This in turn suggests that analysing data concerning disability into just one unified category could be problematic when investigating computer use and that ideally we should analyse trends by type of condition to reflect 'the divergent situations faced by people living with different disabilities' (Dobransky and Hargittai, 2006; p. 331).

More recently in the UK, an Equality and Human Rights Commission report (EHRC, 2010; p. 370) found little data on access to the Internet by people with disabilities but drew on the Digital Britain report 2009 (BIS, 2009; Jones, 2010) to suggest that 'only a minority of people with physical and sensory disabilities have broadband access – 42% of people with visual impairments, 32% of people with hearing impairments and 35% of people with mobility impairments have broadband access'. In addition, they highlight problems in accessing web-sites through the use of assistive technologies on mobile platforms. Other studies provide case studies on how this digital divide with regard to access and use of on-line government services can be bridged using assistive tools (Boeltzig, and Pilling, 2007). These included a series of recommendations to increase access for targeted groups as well as increasing actual use by individuals within such groups. Such recommendations seem to echo critical evaluations of e-government initiatives which argue that most e-government services are appropriate for a 'generic, predominantly literate, and able-bodied audience' (Foley et al., 2005; p.10), In this perspective, Bradbrook and Fisher (2004) recommend adaptive ICT for disabled people with particular needs to become available as an assistive technology. They argue that government should work together with the industry and specialist voluntary sector organisations and ensure support and training for disabled people and their personal assistants and carers (Bradbrook and Fisher, 2004). In other studies, researchers have explored the types of reasons why such assistive technologies are rejected even by groups who may require them. Often this extends beyond technical or cost issues to symbolic issues such as perceived restriction, difference and dependency especially amongst some social groups such as the young (Söderström and Ytterhus, 2010).

There are several calls within the published literature for more research in order to gain insights into how people with disabilities use computer-assisted technologies to enhance levels of social capital within communities through, for example, communication and social participation (Goggin and Newell, 2002; Seymour and Lupton, 2004; Watling, 2011). A recurring theme from the literature on ICT access and usage for people with disabilities is the lack of spatially and temporally consistent data. This is particularly the case for data related to the actual use of such technologies which

arguably forms a potentially more important set of barriers to achieving the benefits of computer-based technologies for such individuals. Surveys of Internet take-up, for example, rarely include sections which enquire as to the use amongst disabled groups and there is little evidence of input from people with disabilities into the design of the ICT surveys themselves (Vicente and Lopez, 2010). Often, as Dobransky and Hargittai (2006) found in their review, conclusions are drawn from small samples of data or from studies that have used descriptive statistics applied to large, random samples that do not permit the isolation of attributes associated solely with disability from compounding variables such as old age, low incomes that are often related to disability.

There are also suggestions from the United States that the geography of where people with disabilities actually live may have an influence on patterns of access; these tending to be areas without access to the Internet (Baker et al., 2009; p. 49). Again there is little in the literature to support such propositions and very little data to test such theories. Furthermore, there are inconsistencies in the definition of disability used in previous studies which make it difficult to draw out comparable findings. As they suggest then 'taken together these issues have hampered attempts to discern causal relationships concerning digital inequality regarding disability status' (Dobransky and Hargittai, 2006; p. 314). Even some of the detailed survey information collected in the United States does not contain information on the use of such technologies by some groups, e.g. those with mental health conditions or those with learning difficulties.

5. THE CASE OF WALES

As noted in the introduction of this review, Wales is the focus of our work and it is used as a test-bed to explore the ways in which the networking potential and impacts of ICTs are manifested in areas such as connectivity *within* and *between* minority communities as well as in public service delivery and participation within minority community networks in the UK.

5.1. Digital divides in Wales

Regarding the broader UK context and from a digital inclusion/exclusion perspective, one can come across debates which are similar to the broader debates presented in the introductory discussion of digital divides. Studies in the UK have identified a range of benefits from digital inclusion for disadvantaged people and deprived communities, such as civic participation, costs saving, community engagement, skills acquirement, and higher work and life standards (Digital Inclusion Team, 2007; p. 23). In terms of factors of influence, socio-demographics have been consistently identified as significant explanatory factors of exclusion in the UK. The former Labour Government identified in its *Delivering Digital Inclusion Action Plan* (HM Government, 2009) a range of Internet non-users, with non-use being determined by a range of socio-demographic factors – age, social class, education and so on. At the same time, research commissioned by Ofcom has identified three primary groups in the UK that are considered digitally excluded or part of the 'information have-nots' (Ofcom, 2009; p. 3): those intending to get the Internet in the next six months; the self-excluded who share a sense of indifference, with many struggling to come up with a reason why they should have Internet at home; and the financially/resource excluded who mainly put forward the cost of a computer as the main reason for not having an Internet connection.

Wales is part of the UK context and a quite distinct region that raises its own questions about digital inclusion and development. In Wales there has been a substantial volume of reports accounting for the use and appropriation of information and communication technologies. Overall it has been concluded that in the last few years an increasing penetration of ICTs can be observed in Wales, especially if compared to other regions in the UK (Anderson, 2008). Indicatively, it has been found that the take-up of broadband between 2004 and 2008 has come through a sharp increase from 15% in 2004 to 58% in 2008, with an estimate of further 5% increase by 2009 (Welsh Assembly Government, 2009). Also, it has been found that 99% of households in Wales have access to

broadband, and approximately 60% take it up, while broadband connections account for 9 out 10 connections of Internet users (Bevan Foundation, 2009).

However, it is estimated that there are still about 900,000 people digitally excluded in Wales (Welsh Assembly Government, 2010a), a figure which in turn poses questions as to the extent to which ICT exclusion can influence in a negative way the broader socio-economic dynamics in Wales and particularly the potential of inter-connected communities as well as community structures, cultures and practices in the region. Improvement of access to the Internet and promotion of take-up have been a recurring priority identified by the WAG since devolution onwards and thus the current figures of exclusion have also brought up discussions concerning the importance of education, economic, geographical and socio-cultural parameters in understanding why a significant part of the Welsh population remain digitally excluded (Mitchell, 2006; Selwyn and Gorard, 2002; Welsh Assembly Government, 2009).

On one hand and perhaps unsurprisingly, issues around access and take-up have remained highly salient in the Welsh context due to the specific challenges related to the provision of broadband services in rural and deep-rural areas and the relatively low take-up rates in historically deprived areas of Wales which are marked by greater levels of social exclusion (Welsh Assembly Government, 2010b). More specifically, reports for Wales confirm the role of socio-demographics in technological inclusion in Wales (Welsh Assembly Government, 2009), while placing particular emphasis on geographical parameters and stressing that urban areas are both the least and most 'connected' areas in Wales (Anderson, 2008). At the same time, research carried out by the Welsh Local Government Association (2009) has argued that there is a clear divide in broadband provision between urban and rural areas of Wales and expressed the concern whether this divide will have an impact on social and economic wellbeing of the communities located in rural areas. A Wales Rural Observatory report (2009) noted that there is a clear gap between demand and supply for broadband services within deep rural communities - approximately 91% of households surveyed described broadband as 'essential' or 'desirable' but only 51% received broadband services (Wales Rural Observatory, 2009). However, Bevan Foundation (2009; p.13) recently suggested that Internet and broadband penetration is lower in south Wales Valleys, in big urban centres and in disadvantaged communities rather than in rural areas of Wales.

Recent accounts of digital divides in Wales suggest that we move away from infrastructure issues so as to identify some more qualitative nuances of digital exclusion in Wales (Winckler and Radcliffe, 2010; p. 147). Evidence included in *Delivering a Digital Wales* (Welsh Assembly Government, 2010b) suggests that infrastructure is not any longer an important issue for access to the Internet and that

disengagement with the Internet, whether through personal choice or through social exclusion, could represent a more influential factor worthy of more study.

5.2 ICTs and communities in Wales

Whilst there have been studies that have focused on education and training needs in relation to ICT policy in Wales and wider notions of social inclusion and the economy (see for example, Selwyn and Gorard, 2002), there has been less focus on ICT use and inequalities in access and take-up of ICTs by minority groups within Wales. However, Selwyn and Gorard (2002; p. 53) drew on existing empirical evidence for digital divides which points to inequalities in access to ICT 'patterned along the lines of socio-economic status, income, gender, level of education, age, geography and ethnicity'. Thus they posed the following questions in their volume (2002; p. 14):

- Are ICTs leading to the expansion and extension of public services to all social groups?
- Are ICTs contributing to a democratisation or marginalisation of public participation in political processes, and
- How is access to technology patterned according to individual factors such as age, gender, class, geography (both in terms of distance and terrain) and ethnicity, and, most importantly, how are different social groups then able to make use of this access?

On the other hand, although these questions remain relevant almost a decade later, there has been relatively little in the published literature in the Welsh context into social and community variations[5] in Internet take-up and its effects.

Available evidence about digital exclusion in particular groups or communities in Wales suggests that those from lower social classes, unemployed people and those aged over 65 are less likely to use the Internet and, as in other countries, that spatial patterns of technological deprivation mirrors those of social divides in Wales (Richards, 2009). Similar conclusions regarding the role of socio-economic inequalities in digital exclusion in Wales are reached by the Bevan Foundation's report *Digital Wales, Divided Wales* (2009). Regarding the role of disability, the report found that people with disabilities are also less likely to use the Internet. However, more data is needed on digital inclusion of disability communities in the Welsh context if we are to address one of the primary goals in the Digital Inclusion theme of the *Digital Wales: Delivery Plan* (Welsh Assembly Government, 2011; p. 3) which aims to 'reduce levels of digital exclusion amongst people with disabilities'. Regarding the Welsh

[5] Mackay and Power (1997) engage in a detailed discussion of Welsh identity and community, considering genes, community and language the three defining elements of Welsh identity.

language community in Wales, existing empirical evidence suggests that there are no significant differences between Welsh speaking and non-Welsh speaking communities with regard to Internet adoption rates (Cunliffe, 2009; p. 99), although there are questions over the existing evidence base on whether differences exist in the uptake and use of new technologies. Cunliffe and Roberts-Young (2005) suggest that technological barriers to the use of Welsh have largely been overcome with recent developments in Welsh language software (Welsh Language Board, 2006). There have been encouraging signs, for example, in relation to the use of the Welsh language on Facebook where 'the language has established an active presence on Facebook groups and profiles' (Honeycutt and Cunliffe, 2010; p. 226). Whilst there is some cause for optimism here, the authors caution that 'a much deeper analysis is required in order to understand the impact that this presence is actually having on people's language behavior and the long-term maintenance and revitalization of the language' (Honeycutt and Cunliffe, 2010; p. 244). Selwyn and Gorard (2002; p. 24) point to perceived threats in terms of the 'cultural restrictions' of ICT leading to caution amongst some Welsh language supporters. Overall it has been argued that digital exclusion in Wales parallels other socio-economic and demographic inequalities, with income, social class, age, education, as well as language and disability, representing key drivers of exclusion in the region (Winckler and Radcliffe, 2010: 148). Also, it has been argued that those belonging to different ethnic groups and minorities are those at the forefront of adoption and usage of new information technologies, but with different ethnic groups having varying rates of ICT adoption (Winckler and Radcliffe, 2010; p. 148-9).

In terms of advantages of the Internet for minority communities in Wales, Mackay and Power (1997) attempted early on to track the ways in which the embryonic Internet technologies of that time could constitute a point of revival for Welsh identity and culture. Overall they reached positive conclusions, although, as expected, being sceptical on whether Internet communication had actually created new communities or civic spaces for people in Wales to empower their culture and identity. Later, Selwyn and Gorard (2002; p. 24) discussed inherent advantages of the Internet for the Welsh language and noted that 'the establishment of Welsh as one of the many languages of the Internet has taken place over the last 10 years' and document developments for example in the development of ICT-based Welsh language learning courses. Cunliffe and Roberts-Young (2005) use a review of existing sites to highlight the importance of web-sites that use the Welsh language for information dissemination and participation in the civic society in Wales. An even more recent study of Welsh language on the Internet (Cunliffe, 2009) presents examples of how the Internet is used as an instrument of Welsh language resistance and thus for language-related cultural preservation in communities where Welsh identity elements remain strong. Cunliffe (2009; p. 98) mentions the existence of a strong tradition of software localization into Welsh, supported by the Welsh Language

Board and its policy of free Welsh-language IT resources, as well as the existence of commercial software produced by software developers in Wales which provides bilingual and Welsh language tools. Also, he confirms the role of the Internet in creating or regenerating Welsh-speaking communities as well as in encouraging Welsh diasporic communities to exist in countries far away from Wales, such as the USA: '…the Internet is providing new opportunities for asserting and negotiating Welsh identity within an emerging virtual Welsh (and partly Welsh-speaking) community.' (Cunliffe, 2009; p. 104). On the other hand, he argues that, regardless of the existence of numerous websites, forums and blogs in Welsh language and for the promotion of Welsh language on the Internet (and resistance to 'Anglicization'), there is insufficient provision for Welsh-speaking Internet users to conduct all their activities and transactions online through the medium of Welsh, as provision is currently patchy and varies in quality (Cunliffe, 2009). In this respect, case study work has found that online use of the Welsh language by bilingual users needs more supporting tools and mechanisms as users tend to use online English more than Welsh (Cunliffe and Harries, 2005). More recently, Cunliffe (2010) drew attention to a survey of Welsh speakers commissioned by the Welsh Consumer Council (in 2007) that found that the percentage of fluent Welsh speakers going on-line was less than either that of the non-Welsh speakers sampled or those less fluent. Although potentially hindered by the relatively small numbers of people sampled, this has to be seen in the light of the rising numbers across all groups and the importance of age (the most significant factor in the survey affecting the likelihood of accessing the Internet). Thus such findings could be influenced by the age profile of the individuals surveyed and could thus mirror the age profile of fluent Welsh speakers (which tend to have an older age profile). This is reflected in the percentage who said they did not have a home Internet connection or have slower connection. The survey did not have information on whether the surveyed individuals were accessing services through the medium of Welsh.

Findings in the Welsh context seem to more or less confirm what research has found about the correlation of social disadvantages and digital exclusion across the UK and the argument that 'those who are most deprived socially are also least likely to have access to digital resources such as online services' (Helsper, 2008; p. 9). On the other hand, recent literature has highlighted the importance of personal choice in digital inclusion or exclusion, and most non-users in Wales appear not to desire to use the Internet or other ICT even when they are not deprived of the necessary equipment, skills or financial means to begin usage (Richards, 2009; p. 23; Winckler and Radcliffe, 2010; p. 149). This is a trend met not only in Wales and in the UK more broadly but also internationally and gives rise to the argument of 'self-resistance' or digital choice: 'simply providing access…is not enough – digital disengagement is a complex compound problem involving cultural, social and attitudinal factors and

in some cases informed 'digital choice' (Helsper, 2008; p. 15).

Therefore the question for Wales is whether non-use is really a 'choice' and, if so, how it is linked to skills, opportunities, awareness and other barriers that disadvantaged or minority groups face (Winckler and Radcliffe, 2010; p.152). This is to say that, whilst a lot of attention has been paid to the role of spatiality and socio-demographics in digital inclusion in Wales, more attention needs to be drawn to other, non-socio-demographic, cultural and personal parameters to explain non-adoption of ICTs in the Welsh context. Along these lines and in order to sufficiently and insightfully explain why about one third of the population in Wales do not use the Internet, one should look at cost, lack of relevance and lack of knowledge of how to use it, alongside social, personal and identity characteristics, such as ethnicity/language and disability, including being in a lower socio-economic group, over 65 years old or living in a rural area where broadband availability is still patchy (Richards, 2009; p. 31). Such a suggestion for community- or group-oriented examination of drivers of digital inclusion/exclusion in Wales brings us back to the proposal made in the first section of this review for a community approach to analysing digital divides and highlights the importance of such an approach in order research to reach conclusions about the role of ICTs in the experience and feeling of 'connectedness' *within* and *between* minority communities in Wales.

Nevertheless, more evidence is needed. The WAG noted in its *Delivering Digital Inclusion* consultation (2010c; p. 10) that there is 'insufficient or inadequate baseline data' for digital inclusion below the all-Wales level. The Bevan Foundation (2009; p. 9) observes a variation in research findings concerning broadband penetration in Wales. Likewise, the Welsh Affairs Committee (2009) concludes in its report on digital inclusion in Wales[6] that there is limited evidence in Wales, while it considers there is no significant evidence that digital inclusion in Wales is significantly greater or different in nature than exclusion in the rest of the UK. The same report also stresses factors of exclusion which are of particular relevance to the Welsh context, such as low income and a sparsely populated rural geography (2009), with the latter contrasting with the findings of other research which has found about the high Internet penetration rates in Welsh rural areas (see, for example, Bevan Foundation, 2009).

[6] You can download the report from http://www.publications.parliament.uk/pa/cm200809/cmselect/cmwelaf/305/30502.htm

5.3 Preliminary reflections on digital divides and policy-making in Wales

The 'digital divide' reflects a range of social, economic, cultural, personal and even political factors and therefore responding to poor access or take-up in, for instance, the Heads of the Valleys is likely to require a very different policy response to mid-Wales authorities, such as Powys and Ceredigion. Such a policy response is actually required, as Welsh non-users are subject to the socio-economic and other disadvantages that non-users anywhere else are subject to due to non-use of the Internet (Winckler and Radcliffe, 2010; p. 150). The need for policy initiatives focused on broadband penetration in particular has been supported by reports which estimate the net benefit of broadband on the Welsh economy over the period 2000 to 2015 to be £1,387 million and that programmes such as the *Broadband Wales Programme* can deliver benefits of up to £357 million during the period 2000 to 2015 (Atkins, 2006). Also, policy-makers in Wales are faced with the challenge to ensure the necessary infrastructure for super fast broadband in rural and with low population density landscapes (Atkins, 2006).

The WAG identified the importance of digital inclusion at a very early stage following the introduction of devolution in 1999 and expressed its commitment to delivering on this issue through successive strategies and policy initiatives*: Cymru Ar-lein: Online for a Better Wales* (2001), *Broadband Wales Programme* (2002), *Towards e-Wales: Exploiting the power of ICT in Wales* (2006) and *Delivering Digital Inclusion: a Strategic Framework for Wales* (2010a). The WAG has set up a Digital Inclusion Unit for the promotion of digital inclusion and has engaged in the development of a robust evidence base in terms of monitoring and benchmarking ICT within Wales. In a way, most of the Departments under the WAG have been involved in the vision to take forward and implement digital inclusion across Wales and from different perspectives. For example, much of the Assembly Government's *Broadband Wales Programme* (2002-07) was guided by the *Ubiquitous Broadband Infrastructure for Wales* report commissioned by the Welsh Development Agency and aimed to provide a comprehensive analysis of the context in Wales for broadband development. The Citizens First Wales team of the Assembly offered ICT support for visually impaired people, thus reviewing the suitability of ICT requirements for people with visual impairment and providing apt advice and support to those visually impaired (Welsh Assembly Government, 2009). The Assembly Government has also initiated a range of other programmes and funds in order to address the different and diverse dimensions and causes of digital inclusion. For instance, it created the *Regional Innovative Broadband Support* to address the needs of those difficult to reach in particular or deprived areas. Also in 2004 it started the *Public Sector Broadband Aggregation* (PSBA) activity as part of the *Broadband Wales Programme* to address the technological needs of the public sector.

However, the Welsh Affairs Select Committee (2009; p. 3) remarks that no account has been taken in the Welsh Government's digital inclusion policy of the needs of Welsh language speakers. This Welsh Affairs Select Committee report remarks that, whereas the WAG has had a digital inclusion programme running for a few years, there remains a need for it to establish objective base measurements of digital exclusion in Wales to be used for setting specific targets and against which to monitor future progress (2009; p. 52).

From a purely community perspective, the WAG has initiated the Communities 2.0 programme (2009-2015), which builds on the Communities@One[7] initiative launched in 2006 and ended in 2009 to help people use technologies in communities that need it most in Wales. This programme aims to engage community groups, voluntary organisations and social enterprises in Wales and convince them to do more with technology, also increasing connectivity and communication levels. Evaluations of the Communities@One programme were positive as it supported more than 200 projects with an emphasis placed on small communities. It is thought that the programme helped communities improve their ICT assess and skills standards, and that it was flexible, diverse and well-responding to community needs (Welsh Assembly Government, 2008). However, such evaluations omit to say that the programme approached communities in an old-fashion way, defining them geographically and socio-economically and failing to shed light into the needs of ethnic/language, disability and other minority or special interest communities in Wales. Also, this programme seems not to reflect on what UK-wide research has found about the high digital engagement of particular ethnic groups, such as Afro-Caribbean groups (Helsper, 2008; p. 10), as well as the barriers to digital inclusion and engagement arising from social isolation of particular groups, such as disability groups which are less likely to access the Internet and use advanced Internet applications and services (Helsper, 2008; p. 12-13). This means that Welsh authorities must listen to calls on local government in the UK for initiatives that address negative attitudes toward technologies and the Internet and which go beyond financial support of access, as 'the problems of access are cultural as well as economic' (Helsper, 2008; p. 15).

In summary, there is a clear need for well-informed policy action in order to overcome digital divides in Wales; action which draws on existing studies to address policy questions and challenges and their connectivity impact. What one can hypothesise is that such a mapping of study and policy gaps will identify the complex and diverse drivers and connectivity effects of digital inclusion/exclusion in minority communities in Wales such as ethnic/language and disability communities. Previous research has suggested that cultural and personal attributes, norms and attitudes matter for understanding the degree and quality of digital connectivity and engagement of communities and

[7] For more information on Communities@One, see at http://www.communitiesatone.org/

individuals in communities. Thus ethnicity, which embraces the elements of religion, language, life-style and cultural values, as well as physical, cognitive, mental and emotional disabilities are critical parameters to investigate into more detail.

The paucity of data on digital exclusion and the lack of demographic analysis are highlighted as key challenges in the *Delivering Digital Inclusion* framework for Wales in order to politically support priority groups (Welsh Assembly Government, 2010b; p. 7). In particular more research of minority groups in Wales and their technologically enabled connectivity is needed in order policy-makers to develop strategies that address the unique set of circumstances surrounding the use of digital technologies. As the framework document recognises, for example, 'a high proportion of people with disabilities are likely to be excluded, although it is necessary to recognise the differing needs of different groups' (Welsh Assembly Government, 2010b; p. 9).

6. SUMMARY OF FINDINGS

This literature review has discussed the conceptual foundations of our research and the existing literature in relation to ICTs and minority groups. This has involved a critical review of key studies in the field that examine one or more aspects of ICTs, communities and connectivity in order to promote a wider discussion of existing evidence and identify knowledge gaps. Here we provide a summary of findings from reviewing the literature and research work and describe how we aim to redress some of these findings in our work. Specifically we highlight how these review findings feed into our three-pronged approach to conduct a systematic research review of existing empirical data, make methodological recommendations and provide reflections on research required to inform the future direction of policy.

6.1 Conceptual reflections

First, reflections on key concepts and notions drawn from the literature illustrate the need to elaborate and further refine the conceptual foundations of our work.

In terms of the concept of ICTs, we can conclude that the vast majority of the literature in the field uses the Internet as either the sole focus of discussion or the main example of ICTs to look at and research and thus, although the term ICTs constitutes the foundation of this project, our work mainly refers to and explores the Internet. As far as the concept of digital divides is concerned, the existing literature highlights the complexity of this concept and our review suggests that we continue revisiting the concept of digital divides and re-researching its facets, causes and effects so that we effectively encounter the exclusion/inclusion challenges new technological developments and people's diverse responses to them relentlessly set. This underpins our argument that potential value can be derived by adopting a community-based approach to digital divides so as to adequately identify their nuances and effects on connectivity of community groups and minority groups in particular.

These reflections guide us to consider the concepts of community and connectivity which both appear in the literature as highly ambiguous and nebulous concepts, with ICTs challenging conventional conceptualisations of community and community connectivity and adding conceptual and real life complexity to them. More specifically, reflections informed by the literature illustrate

that ICTs provide a new focus for conceptually understanding the bridging and bonding forms of social capital and thus for fostering connectivity *within* and *between* communities. ICTs and community connectivity are in turn concepts that set critical questions for connectivity needs and fulfillments *within* and *between* minority community groups in particular. However, the concept of minority communities appears to be the subject of much debate in the literature in terms of how it is defined, discussed and researched, posing the question of how we distinguish minorities from the 'mainstream majority'. Although it is hard to answer this question, we have considered it in the decision ethnicity (and related language attributes) and disability to be the key parameters in examining minority communities in the project.

6.2 Reflections on evidence

Moving beyond reflections on the conceptual foundations of the work, the literature review has enabled us to identify some key evidence in the field as well as associated gaps in the field. In general, the literature highlights the potential role of ICTs in creating 'virtual communities', suggesting that the Internet could provide a new focus for bridging or bonding forms of social capital. At the same time, it suggests that we need a community perspective so that the potential role of ICTs in the revitalisation of communities is researched beyond any optimistic views and predictions of the overall positive impact of ICTs and by considering community attributes, conditions and prospects.

Regarding minority communities, the literature argues that ICTs do provide a new focus for understanding bridging and bonding forms of social capital and thus for fostering connectivity *within* and *between* minority communities. Thus it supports the importance of examining the role of ICTs in strengthening minority communities, enhancing their *within* and *between* 'connectedness' and responding to their perceived problems of social exclusion and limited social or community cohesion. At the same time, evidence points to a series of economic, educational/skills, psychological, cultural and political barriers which prevent minority communities from fully appropriating ICTs. However, it appears there is limited literature base that consistently, systematically and thoroughly discusses the dimensions, causes and effects of digital divides with regard to special or minority groups such as people with disabilities and ethnic minorities with language and other cultural attributes.

Ethnicity, language and disability are the three parameters that demarcate minority communities in the context of our work. By reviewing literature and research specifically for the use and role of ICTs in ethnic, language and disabled communities, we have identified some of the evidence available

and associated gaps in the evidence. In terms of ethnicity, literature reports that racial and ethnic specific communication is now part of public discourse and that key developments in diasporic communication are greatly facilitated by ICTs. The literature introduces the concepts of 'connected immigrant', 'communicative mobility' and 'intimacy at distance' to describe today's trends in ethnic or diasporic communication that takes place via ICTs. In ICT-mediated ethnic or diasporic communication the element of 'connectivity' appears as significantly present, since ethnic minorities who use ICTs get involved in the dual practice of bridging with the host country and bonding with the home country, with ICTs allowing thus ethnic communities to maintain their ethnic identity while accepting new identity elements and integrating themselves in the host country. On the other hand, there exists fragmented and limited evidence of usage patterns of information and communication technologies in migration or ethnic contexts. Further understanding of the internal dynamics of ethnic communities is needed and more consistent and longitudinal evidence of the take up and appropriation of ICTs by the continuously evolving and culturally complex map of ethnic groups is also needed. Along these lines, scholars in this area acknowledge that more user and impact analysis is needed, while more focus on the new 'connected migrant' is suggested.

Taking into consideration the language and other cultural attributes of ethnic communities, language has been the subject of a great deal of debate about linguistic flexibility of online communication and the role of the Internet in the survival of minority languages. Some evidence shows that language groups can use their language online and minority languages can be revitalized and preserved through social, learning, information and multi-media software and content. At the same time, there is some evidence of the existence of barriers to ICT access and use by minority language groups which usually relate to the lack of access to resources in a group's own language, to technical problems concerning how computers and web browsers manage language scripts, as well as to training gaps and insufficiencies. Work in the field emphasises the importance of Unicode compatibility, the localisation of navigation tools available on language-based websites, the importance of people accessing keyboard layouts in their language, and the significance of access to equipment and software as well as to training and support to build community-based websites that use linguistically and culturally appropriate infrastructure and tools. However, literature examining the parameter of 'language' seems to be lacking deep examination of areas that shed light on how ICTs can increase connectivity of groups speaking a language other than the official language and enable those groups become integrated into the public communication system of the country of residence. The evidence available is often placed in a broader framework concerning ICTs in ethnic, immigrant or other minority contexts, thus not always providing a clear focus on the role and importance of 'language' *per se*. Finally, work in this area needs to pay more attention to what

language really does on the Internet and how it influences, if at all, the user who makes use of it online.

In terms of disability and ICTs, the literature seems to place emphasis on the problematic character of the term 'disability' and a number of works highlight the argument of the social construction of 'digital disability'. Evidence suggests that distance learning programmes available online, engagement in mobile video communications and distance education in sign language (important for deaf people), as well as Web 2.0 services and applications can all enhance connectivity of disabled people through online support groups, disability-related networks and communication patterns which provide an escape from stigma and social isolation. On the other hand, evidence suggests that the cost of purchase of adaptive technologies, negative feelings towards the use of the Internet and heightened concerns about Internet security constitute barriers for disabled people to access and advantageously use the Internet. However, given that these issues have only emerged in recent years, there appears to be a relatively small amount of spatially and temporally consistent evidence focused directly on the use of ICTs by disabled people, namely on actual ICT use patterns amongst disabled groups. This could be also related to the finding that some categories of disability tend to be ignored by the literature, showing the difficulty in reaching clear conclusions about the relative influence of physical, mental or learning impairments. Also, it could be related to the finding that conclusions are often drawn from small samples of data or from studies that have used descriptive statistics applied to large, random samples that do not permit the isolation of attributes associated solely with disability. Thus there are several calls in the published literature for more research in order to gain insights into how people with disabilities use computer-assisted technologies to enhance levels of social capital within communities through, for example, communication and social participation.

Regarding gaps in the evidence of digital divides across ethnic, language and disabled communities, there appears to be some conflicting evidence regarding the significance of ethnicity, language and disability as standalone explanatory factors influencing variations in Internet access and/or use. Work in the field also often provides conflicting and overall insufficient evidence about the possible links of the parameters of ethnicity, disability and language with socio-demographic and other population-wide barriers to digital inclusion. In other words, the literature does not seem to answer with sufficient certainty and consistency the question of whether ethnic, disability and language communities are digitally excluded.

Finally, our brief introduction to the Welsh context shows that the literature confirms for Wales most of the arguments put forward for digital divides and connectivity of minority communities in

different contexts to that of Wales. Findings in the Welsh context confirm findings regarding the correlation of social disadvantages and digital exclusion across the UK, whilst implying that we should place less emphasis on the importance of infrastructure issues. Such findings also suggest that factors such as disengagement with the Internet, whether through personal choice or through social exclusion, could represent more influential factors worthy of more study. Thus existing evidence suggests that digital exclusion in Wales parallels other socio-economic and demographic inequalities, with income, social class, age, education, as well as language and disability, representing key drivers of exclusion in the region. Whilst there have been studies on digital inclusion and wider notions of social inclusion in Wales, the evidence in the published literature on social and community variations in Internet take-up and its effects in the Welsh context is limited. More work into ICT access and usage amongst minority groups in Wales, their ICT enabled connectivity and related barriers to wider use is needed in order to develop strategies that address the range of opportunities and challenges surrounding the use of ICTs. There is an acknowledged paucity of data on digital exclusion and a lack of demographic analysis which remain as key challenges in drawing up digital inclusion policies that support priority groups and communities in Wales and that address the unique set of circumstances surrounding the use of digital technologies by those groups.

Overall our review has identified the need for more systematic, comprehensive, consistent, longitudinal and user- or community-grounded accounts of the use of ICTs by ethnic, language and disability minorities. Such research could play a part in the way we understand intra- and cross-community, as well as broader social and political connectedness, thus enabling us to depart from the concept of 'connectivity' which is limited to the broad notions of 'information', 'communication' and 'networking. In methodological terms, it appears survey or quantitative research prevails over qualitative evidence and ethnographic studies. We therefore suggest that more qualitative research is needed in order to provide more depth and understanding in the analysis of appropriation or non-appropriation of ICTs.

6.3 Implications for the work that follows

As a result of the above evidence and gaps in the evidence, we consider that the literature does not always fully and consistently answer key questions of research, community and policy interest, thus raising, as an implication, the need for further research. Hence, we conclude with a series of reflections which will influence our direction of research (see Figure 1).

First, we conclude that a systematic review of all available research data (empirical data) on ICT adoption in Wales is required. Although the project in general aims to address connectivity opportunities and challenges for minority communities in Wales as they arise from the take-up and use of ICTs, this systematic research review will be focused on Internet-enabled connectivity to be in line with the vast majority of the literature in the field which is looking at the Internet. Thus it will review research examining Internet use and not ICT use broadly, while accounting for all different platforms – desktop computer, mobile phones, portable computers etc – employed by people to access and use the Internet. In the research review, connectivity will be approached on the basis of the concept of social capital and the associated process of bonding and bridging discussed in this paper. Thus connectivity will be operationalised and the following dimensions of it will be examined: sociability, community engagement, political engagement, mobilisation, participation, personal development, social inclusion, and other possible forms of connectivity. The research review will also reflect on what quantitative and qualitative data exist for examining Internet use/non-use and connectivity in minority communities in Wales, while addressing some of the gaps identified in the literature and thus testing key arguments put forward by scholars in this inter-disciplinary field of work. More specifically, the research review will analyse the following questions so as to better evaluate the existing research and to make recommendations for future research:

- The geographical and population coverage of research;
- The aspects of digital inclusion/exclusion tackled;
- Participation of minority communities in research;
- The question of community connectivity and its various facets;
- The balance between qualitative/ethnographic and quantitative and ethnographic research;
- Richness of data available for Wales and implications for UK-wide research; and
- Relevance of research to policy-making, industry practices and future initiatives in this area.

Finally, the research review will make methodological recommendations so as to offer a 'best research practice guide' on what research is needed and what research questions need to be addressed at both regional and national levels. Thus the research review results will constitute the backbone for the 'methodological recommendations' paper to be produced at the end of the project.

Regarding the question of relevance of research to policy-making that the research review will explore and address, the preliminary reflections on digital divides and policy-making in Wales offered in this paper suggest that looking more closely at available research data would be of benefit not just to the academics but also to policy-makers. Thus we aim to produce a policy paper which

will draw upon the findings of the research review to summarise and reflect on issues of policy-making interest. Such a paper will critically discuss policy initiatives regarding affordability, accessibility, usability, training and continuous support, as these appear to be some of the most pressing areas for policy action in order to bridge digital divides between minority communities and the rest of the population. Also, it will provide a critical review of policy initiatives in Wales in comparison to similar initiatives in England, Scotland and the Northern Ireland. In this sense, the policy paper will greatly benefit from the research review so as to make recommendations on how policy-makers in Wales should collaborate with researchers to encourage more and better research in the future and in close communication with minority communities and their representatives in the region.

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