



The digital divide and the theory of optimal slack

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Abstract

The digital divide and exclusion from the knowledge society have become important subjects of government policy. This article compares online communities located in two UK housing estates. Both have relatively high levels of computer literacy but also significant numbers of novices and non-users. It is argued that one estate is achieving a higher level of inclusion because it combines teamwork with optimal levels of organizational slack. Further, this article discusses the optimal conditions for creating an information and communication technology (ICT) learning community and hence contribute to the debate on how best to overcome the digital divide. The possible implications of the findings are explored in terms of policy initiatives.

Key words

digital divide • information technology online communities
slack • teamwork

INTRODUCTION

As knowledge through the resource of information technology has been conceived as an essential human capital, so we have referred to an 'information society'. The notion of an information society "was coined to

describe the type of society that would result from the expansion of communication technology, the generalization of digitalization technology and the strategic importance of information and knowledge in modern economies (Tremblay, 1995: 471). Although such a conception of society 'often assumes lyric proportions', the notion raises significant additional concerns about social exclusion:

In the global digital information age those who are unable to access the internet and the World Wide Web through the application of information and communication technologies (ICTs) are increasingly disadvantaged in their access to information ... The 'digital divide' has become a convenient metaphor to describe the perceived disadvantage of those who either are unable or do not choose to make use of these technologies in their daily life. (Cullen, 2001)

However, Brady takes a critical view of the whole notion of a digital divide, arguing that: 'Even lower income families could find a way to get wired if they viewed it as a high enough priority'¹ (2000). This article disagrees with such oversimplified assertions, because the research it reports illustrates the relatively high barriers to 'getting wired' and that these can go beyond physically acquiring and affording communication technologies (Selwyn, 2004, 2006). Further, there is evidence that if those barriers can be overcome, then access to ICTs (e.g. through mobile phone technology) generated from within is indeed a potent aid to economic and social development of even extremely disadvantaged communities (e.g. Centre for Economic Policy Research, 2005; Cronm, 2004; Dutta-Bergman, 2005; Ross, 2004).

Policies have been put in place in most affluent countries aimed at encouraging the excluded to participate (Cullen, 2001). It is acknowledged that these have had limited success (Bridges Report, 2001). A number of explanations have been forwarded for this. Selwyn (2004) argues that engagement -with the web requires more than the physical access provision, often in a public location. This emphasis on access is criticized for 'technological determinism' (for discussion see Rodino-Colocino, 2006). It does not take into account that early users need both the cultural capital presupposed by the media and localized face-to-face support networks to develop. Further, the help often found so necessary when starting to use computing and the internet can be financially out of reach, inappropriate or too difficult and/or intimidating to access (Doherty et al., 2002; Kiesler et al., 2000; Pierce, 2004). Thus, uptake continues to reflect existing inequalities and an overemphasis on technological access or skills development fails, as it does not take adequate account of social factors (Doherty et al., 2002; Rodino-Colocino, 2006; Selwyn, 2006). For Myles (2004), new web users resent entering an environment colonized by experts and commercial interests. Mehra et al. (2004) note that accessing the web can have different meanings to different social groups of people, and there is fairly consistent evidence that much uptake of computing and the internet is

motivated by furthering offline interests (Keisler et al., 2000). This is at odds with many formal programmes that, for Rodino-Colocino, are about training, not education, and debatably represent 'employers' interests in developing a work-ready labor force¹ (2006: 496), rather than individual concerns. Thus, we have insufficiently conceptualized the expectations of the marginalized to engage them.

This article presents the findings from two separate, but closely linked, self-help¹ projects in the UK: a housing cooperative and a local government-managed housing estate (council estate).² In its efforts to explain their relative success in increasingly drawing fellow tenants into intranet and internet use, it draws on the theory of 'optimal slack' and briefly refer to 'teamworking'. It suggests that 'slack'¹, as a theory developed in relation to commercial organizations, is applicable to these projects. This is because both communities, in their different ways, set up not-for-profit internet service providers (ISPs) to serve their tenants, managed from within the community, and both aim at high usage primarily to be achieved through internal resources.

The following two sections set out the research methodology and briefly contrast the theory of operational slack with conventional economic theory. Then the two housing estates are introduced, and the data on which the conclusions are based are discussed. In order to assess the value of the assistance available to tenants on the two estates, their needs are listed and illustrated. This is then set against our understanding of the help made available to them. Finally, the theory of optimal slack is combined with our understanding of ICT skills development, in order to identify optimal conditions for an ICT learning community. The article concludes with a number of implications for government and community policy.

METHOD

The research presented here was carried out within a larger stream of enquiry concerned with the human issues of security and privacy in e-commerce and e-business (HiSPEC) from a variety of viewpoints, including a bank (as a provider of e-transactions), small and medium-sized enterprises and customers. This particular strand of the research sought to understand the factors affecting inclusion and exclusion from use of ICT in two communities who were partners in the research. The research was carried out by a team of cross-disciplinary university-based researchers drawn from informatics, computer software development, psychology, sociology and marketing. Financial support was gained from UK research funding councils and the UK Department of Trade and Industry, to match the funding from a UK bank, which was also a research partner.

The communities are of interest as 'unique cases' (Yin, 1994: 39) because *a priori* they had developed towards successful, self-help online communities

(Preece, 2000). At the commencement of the research, the council estate had established a website with a functioning intranet connecting some 60 flats. The housing cooperative had established a "website and a network group (team) to respond to the financial opportunity the research offered. Both estates, therefore, have web location as well as a physical location. Our respondents were recruited from residents of the two estates. As recommended by Howard (2002), we were able to make a purposeful selection across ICT novices, those with limited experience and the more 'expert' users. However, although our recruitment included women and men in differing situations, our respondents were examples of internet users and in no sense comprised a representative sample of a presumed population.

The data presented here are mostly from two sources. First, participant observation including attendance at community meetings, periods of residence on each estate (see Yin, 1994: 87), general conversations and socializing and participating in community activities. Such approaches have been acknowledged as useful in understanding organizations (Howard, 2002; Vinten, 1994). Second, we also draw on semi-structured interviews, diaries, a small questionnaire survey and recorded telephone conversations between researcher and respondents. These were part of a variety of qualitative and quantitative methods employed during the research.

This was 'open research' (Hammersley and Atkinson, 1995: 141) in the sense that the researchers made no effort to disguise their role. They were known or introduced to members of the community as researchers. This approach presented few problems since both communities had previously attracted research interest. Nevertheless, the research access required ongoing negotiation (Hammersley and Atkinson, 1995) as part of rapport building.

Researchers took the role of 'observer as participant' (Hammersley and Atkinson, 1995: 108) by, for example, managing (and slightly extending) a questionnaire previously developed by the community.

The approach to the research was primarily, but not exclusively, qualitative. It draws on ethnographic approaches that seek to give meaning to people's narratives through a broad understanding of their social and individual lives.

[This] involves the ethnographer participating in people's lives for an extended period of time, watching what happens, listening to what is said, asking questions - in fact, collecting whatever data are available to throw light on the issues that are the focus of the research. (Hammersley and Atkinson, 1995: 1)

We also draw on grounded theory (Strauss and Corbin, 1998) to the extent that we sought to understand actors' priorities. The focus of the research was human perceptions of security and privacy in e-commerce and this necessarily imposed an agenda on the research. However, in this study it was

the participant's perceptions that were important. As Strauss and Corbin say of grounded theory:

[I]t is **important** to point out that the interviewer [does] not have a list of preset questions to ask. Rather, she [asks] the questions based on responses given to the previous questions. (1998: 106)

Thus in collecting data, the researcher is guided by the participant's perceptions rather than entirely by the research agenda.

The research was longitudinal. We engaged with the communities over an 18 month period. This allowed us to follow novice and relatively inexperienced internet users through time. Names and some details have been changed to preserve anonymity.

Organization and organizational slack

Organizational slack is anathema to conventional economic theory. Within that paradigm, slack (or we might stereotypically refer to 'slacking') represents waste and is ideally to be rated at zero. Throughout the 1980s the economic rationale in many countries and businesses had been to cut through slack.

Many writers (DeMarco, 2002; Hirschman, 1970; Lawson, 2001), however, consider slack to be essential to the much-revered learning organization in generating flexibility, innovation and learning. Lawson, in particular, argues that slack in an organization is required 'to provide the time and resources that facilitate higher rather than lower levels of human functioning' (2001). She maintains that to reap these benefits, there must be a commitment in the organization to allowing thinking time and the inclusion of reading and discussion that are not directly production oriented. Moreover, 'for an innovative and learning environment to emerge, failure must be allowed' (Lawson, 2001). These are, she notes, intensely human activities. We will argue that it is significant that she refers to those who engage in these activities, the 'knowledge workers', as intrinsic to the organization rather than to be outsourced.

The value of slack, therefore, is to be found in the longer-term and in the wider system. This is particularly important in terms of ICT, it is argued (Lawson, 2001), because of the complex nature of the systems it generates.

The concepts of slack have been developed primarily with reference to business organizations, government and other institutions. In businesses, slack is perceived as having an optimal level (Geiger and Cashen, 2002; Nohria and Gulati, 1996) beyond which it becomes counterproductive and undisciplined. Academics have sought to refine the nature and value of slack.

Contrary to Hirschman's use, we speak of 'part unemployment' as available slack. Our use of the concept here in respect of communities might, at first reading, seem quite different to those to which we have referred. However,

we will seek to show that many of the concepts that now comprise the theory apply similarly to communities in wider populations. It is not coincidental that Hirschman (1970) revived the concept of slack in order to be able to describe the functioning of more or less recoverable systems. In our case we might be said to be considering a recoverable digital divide.

We argue that available slack that facilitates the adoption of ICT by otherwise excluded people should be seen in the same beneficial way as a degree of organizational slack in businesses. The same arguments about learning, space for failure and intrinsic knowledge workers should therefore be applicable. In other words, people who learn new skills become among the 'knowledge workers' in their community and/or employable: they gain economic value. Here we might also further the comparison with a business setting by concurring with the Keisler et al. (2000) analogy of the spread of technical knowledge within families to the model of specialized workplace information gate keepers.

Nohria and Gulati defined slack as 'the pool of resources in an organization that is in excess of the minimum necessary to produce a given level of organizational output' (1996: 1246). Such resources are important precisely because they can be used in a 'discretionary manner'¹ (Dimmick and Murray, 1978: 616). Discretion is what distinguishes slack from formally managed innovation.

Our findings suggest that 'knowledge work' is not something that should primarily be provided as an external service in trying to engage communities in computer and internet use: ICT courses, resource allocation, etc. Such instruments are not sufficiently responsive to the needs of ICT novices. We concur with previous work suggesting that novices may actively avoid using formal sources of technical help, preferring to ask friends and family (Keisler et al., 2000; Selwyn et al., 2006). With little background knowledge, they are unable to formulate their problems or may feel embarrassed to show their lack of understanding of the problem and, moreover, the solution (Keisler et al., 2000). Neither is the help necessarily available when the user may need it. Consequently, to be effective, this help should be integrated into the community fabric as available slack (see Geiger and Cashen, 2002 for this argument in relation to business organizations). It is then available without embarrassment as with a 'friend'; it is available to call upon repeatedly for some recurrent (and therefore embarrassing) problem; it is available flexibly and not just at fixed infrequent times. Most importantly, help must be available because it is available slack.

Those excluded from the knowledge society require a range of supports. Most often they will require computer hardware, software, an internet connection, training, a helpline and encouragement through a network of 'friends'. Providing optimal support has proved to be more complex than anticipated (Kiesler et al., 2000; Selwyn, 2006) We will argue that a range of skills that might be found in a team of knowledge workers best fulfils this

role. Drawing on the work of Belbin et al. (1976), Buhler and McCann (1989) posit that to work effectively a team needs the blend of talents. We would add that this blend has to be made available effectively to the 'consumer'.

Online communities

In this section we offer a brief introduction to our two cases. The residents of both communities were Equally heterogeneous in age, gender and income but residents of the housing cooperative tended towards more years of formal education and to be in full-time employment. However, examples of people not working and/or highly educated can be found in both communities. We considered these communities to be relatively successful in providing intranet (and in most cases internet) access to their tenants. At the time of writing the housing cooperative reported 47 percent of households online and the larger council estate in the order of 60 percent online.

A group of members in each community were charged with the 'wiring' of all dwellings in their respective buildings, motivated by common beliefs in the values of social inclusion/social capital¹ and personal empowerment and their experiences that these are fostered by intranet and internet use (Dutta-Bergman, 2005; Matei and Ball-Rokeach, 2003; Shah et al., 2001). For example, the community messaging system on the council estate intranet achieved the equivalent of a successful 'neighbourhood watch' function.

Key members of each community were involved in the research, serving on the steering committee and acting as a bridge in helping to encourage other community members to participate. As partners in the research, funds were available to match verified work input from the communities. For example, time spent by a community member installing cables or on software development for the project would be reimbursed at a commercial rate. The collaborating bank donated computing equipment surplus to needs, as well as acting as a source of technical advice to the communities. Thus, new computer users were able to share their early experiences of email and internet use with the study.

The housing cooperative

The housing cooperative was started in 1987 by a group of mostly young single people looking to have more control over their affairs than local government authority or other rented property would give them. The new building in an inner-city regeneration area was deliberately engineered to have workspace and accommodation variety, be more environmentally sustainable than legally required and to have a communal court. The first phase of 50 flats in three to five storeys and workspace was completed in the mid-1990s. Many from the original generation with children have now moved to larger apartments, therefore the age profile of the housing

cooperative was maturing. However, recently the cooperative added 25 flats to the original 50, so there has been an influx of new, mostly young tenants. This completes the building around a courtyard.

The cooperative has a constitution for inclusion. An example of this is that all tenants are 'required' to serve on one of the many committees: rents, finance, maintenance, etc. New members have to demonstrate interest in the running of the cooperative over a period of time before they might be offered a tenancy. There is a waiting list for tenancies.

The installation of their planned computer network was being developed during the research period, with the aim of giving every flat access to the intranet (eventually including tenant management tools) and the internet. In accordance with their cooperative principles, installation was undertaken by some of the residents themselves.

The council estate

The local government authority built the council estate in the late 1940s. There are some 250 dwellings in four, three-storey blocks: it has a moderately transitory population. There has been considerable enthusiasm from groups of tenants for many schemes through the years. Tenants have arranged recycling projects, community protection against street crime, sustainable energy and productive use of communal gardens, to name but a few. Unlike the housing cooperative, all involvement in committees seems entirely voluntary.

In the late 1990s some tenants on the estate established a computer network. In the last year this has been expanded considerably, and currently serves about 150 of the dwellings. The intranet provides, among other services, tenant management information and opportunities to exchange views and post notices.

In return for taking part in the research, the community was given computers, printers, accessories, etc. which were being replaced within the participating companies and university as well as the advice and help made available to the other community.

The nature of ICT help that novices require

From this study's observations of people on these estates, we must conclude that they do not all learn ICT in the same way. However, the data seem to suggest some common themes.

Fundamental requirements remain Significant progress can be made with one aspect of ICT — for example, software use - without diminishing the need for help in more fundamental requirements such as hardware or software installation. At the housing cooperative, Jim (53) talked about help with ICT from knowledgeable mates being 'very useful'. He then articulated what we believe is a common experience: 'When the programme's set up, I can use it but I cannot set it up.'

Daisy (33) is 'impressed' with herself that she has learned to burn CDs. However, her computer exhibited a recurrent fault:

Maybe I just filled it up too much, I don't know ... it's a problem when you do ... use a PC but you don't know how to look after it.

When she was advised to reinstall the software, she laughed: 'Someone else did it for me.'

On the council estate, Helga (48) is disabled. She spends hours on the internet very proficiently, following her passion for sport. However, she relies on another for evaluating and addressing her privacy needs: 'Also my boyfriend is the computer whiz kid; I just press buttons excitedly. I know he's put up extremely good firewalls and programmes.' All three respondents are lucky enough to have close friends on hand to help. Even more experienced users, such as Rich (early 30s), rely on others. Asked how a 'secure shell' works on a system that he uses, he said:

I don't really know, to tell you the truth ... Paul set it up for me___S'like basically, er, there are securing implications ... I wouldn't have done it [set up the server] without consulting Paul about the security implications anyway.

Mandy (30) provided the rationale for this approach:

I don't understand really how ... the internet works or how email works ... but I could spend loads of time worrying about that and hampering my activities, or I could just kind of get on with it.

Problems can be recurrent Procedures that are rarely needed or rarely used are easily forgotten. Asking about them repeatedly can become embarrassing. Requirements for help, especially among novices, might not be amenable to one-off expert assistance. For example, changing the location of a computer, encountering recurrent hardware or software problems and engaging in a learning process are all likely to require periodic assistance. In addition, requirements are unlikely to be predictable. At the housing cooperative, for **example, Janet** (37) decided to move her online computer:

There's a few people round here that can help me ... it's been set-up downstairs and now it's upstairs ... Most of my work stuff is upstairs.

She will have to ask busy people again for the same process of assistance.

On the council estate, Alice (28) recognizes that, for her, repetition is the best way of consolidating a learned procedure:

If you are determined to do it and you sit down and you do it and then you repeat it and you make it ... and you make sure you are doing it and doing it and doing it ... it becomes habitual.

However, such a strategy has limits. Indeed, the implication^X is that problems will have to be revisited and techniques will not always be remembered.

Learning is incremental. A?, learning occurs, new possibilities, challenges and requirements for assistance arise. However, teaching in advance of necessity {as is likely to happen in formal training} is less effective. Among others, Jim and Daisy are interested in online discussion groups. Jim, spoke enthusiastically of the possibilities for local politics and boat-building, while Daisy saw the chance to widen her understanding of prison conditions. Both began enthusiastically to use the email software that others had installed on their computers.

Daisy reported being 'overwhelmed by emails from Prison User Notebooks'. By that time, Jim had been shown how to use files to organize incoming mail. Daisy had just begun to receive unwelcome (pornographic) emails and wanted advice. During the research, this had been an increasing problem for Harry (40). In the second telephone conversation he said:

They send you one saying would you like to unsubscribe from this mailing list, and apparently if you respond to that, even to say, 'Yes, I don't want to get these emails any more', they then know that your email address is active and send you tons more of them and spread your ... I don't know what they do, but sell your email address on to who knows who else.

Whilst being unclear about the mechanisms, Harry articulates the notion that internet interactions increase the user's exposure even when they seem to be designed to achieve the opposite.

However, he was not without advice:

That's the word on the streets, just is delete them and delete them and delete them. Don't respond, don't open them. And eventually they might go away if you don't respond.

Harry found privacy software on the internet. This, he said, had limited success because they 'don't use rude terms' but was eventually advised to change his email address. It was the *experience* of overwhelming and unwanted emails that concentrated these respondents' attention on coping measures. We presume that such information might have been lost as part of a multitude of pieces of advice about email in any initial training session.

Novices can fail and mistakes can lead to seemingly intractable positions. Simon (age unknown) wanted a new computer that would run translation software. Jerry, one of the 'experts' on the housing estate, advised him on the hardware parts he would need, because parts would be less expensive than buying a complete computer. However, Simon bought a package of parts from a retailer. Some of these, in Jerry's expert opinion, were unsuitable to Simon's needs and other parts simply incompatible. Jerry and he took the

package back and then they went elsewhere to buy new parts together. It took Jerry six to seven hours to assemble the parts, install the software and get the system running. Since then, Jerry says he has advised regularly on things such as a printer and technical aspects.

Inappropriate help We have described the way in which tenants require flexible help. However, help was not infallibly appropriate. In the following extracts, Alice tells of the trials that she endured "when she transferred her utility supply to an online company in 2001. Her diary in October reads as follows:

An ongoing problem that I must sort out this week is that I transferred my gas and electric to an online supplier. It was my boyfriend's idea and he set it up for me. I have pay-as-you-go card meters but last week I got final bills from the former suppliers. I'm not sure how these have been estimated and one of them is for a large amount. The old supplier can't help and advises me I must sort it out with [the new one].

Instinctively, I would telephone but it's all online. I'm not used to doing business this way and I'm not even sure how to contact them. The whole thing feels out of control. Frustratingly, I'm not self-sufficient on computers. Will go now and do a Google search.

Have found [a new supplier] and blundered my way through the site which I find a little complex. I think I've sent a query explaining the problem but am not sure as there was no visible change when I pressed the submit button. Hope it gets sorted soon. Spent about 4hrs on the computer today.

Nearly two weeks later and three months after signing up with the new supplier, Alice reports that the online company 'can't deal with clients that are 011 meter systems'. More importantly, she begins to articulate her dissatisfaction with the guidance that she has been given in tackling her communications: 'People who are computer literate find it incomprehensible and are not tolerant of people who have basic disabilities.'

Two and a half months later, Alice was asked whether she had sorted out her utilities supply. She said 'no' and was unclear who her utility supplier was now. The online suppliers could be contacted only by internet. Alice considered: 'It's been a disaster from the beginning,' and 'You feel out of control and cut off from your supplier'. She further commented:

I said to [my boyfriend], it would be all right if it was you because you ... you're so comfortable with using them [computers]. It's more, it's more a psychological barrier ... with me. I'm just not used to using computers for doing transactions like that.

We were interested in this sequence of events for two reasons beyond the obvious failure of the online and offline utility companies to support their customer. First, it is suggested that Alice's computer-literate boyfriend had helped her inappropriately. He had insisted on her engaging in processes for which she

did not feel at all prepared. In observations of meetings he had insisted that particular ICT processes were 'easy' when others were clearly confused or daunted and presented ICT as unquestionably a 'good thing'¹ (see Selwyn, 2003). Second, the sequence illustrates the type of ongoing challenges that a novice user might face. They do not present in terms of a single amenable problem; rather they are sequential and sometimes repetitive, as noted earlier.

Continuing in this vein of inappropriateness, we should add to the features of ICT learning discussed previously that computers must be capable of delivering the facilities that interest and are appropriate to individual users (Cullen, 2001; Mehra et al, 2004); and the previously excluded are more likely to have malfunctioning hardware. Friends, for example, gave Jewel (32) a computer with a very respectable specification and an impressively large monitor. However, she assessed that the computer crashed or failed to boot about half the times she used it. Understandably, she said; 'It's annoying me'.

Taken together, the examples described above add up to a requirement for assistance that is appropriate and flexible enough to respond to a series of mostly unpredictable demands. Although some of these respondents took ICT courses, these do not fulfil such ongoing needs.

Helping networks at the council estate

The following is based on observations confirmed (mostly) in informal interviews with Clive and Jerry and telephone conversations with residents on the council estate. Clive and Jerry were assessed to be key players in the online project and good informants. Interviews with Clive took place in the local pub. The researcher met Jerry at a wholefood cooperative cafe and then, perhaps incongruously, moved on to a rather smart 'arty' bar in the city.

Refurbishing computers

Jerry confirmed that there was no shortage of computers. Businesses were looking to pass on their redundant five to 10-year-old models, he said, because it saved disposal costs. The residents' association even undertook to wipe the hard drives for the businesses: this mostly did occur. Knowledge of a source of computers could come from almost anyone.

Jerry confirmed he was the most active person reconfiguring the hardware to make it usable. This was unpaid work. When asked why he spent time doing it, he said that it was partly the challenge. All of the computers had been considered no longer useful. He had the skills to combine the best bits to make them useful to the tenants. As he was doing this he was constantly learning new skills, and getting round what he described as 'the built-in obsolescence' was ecologically sound. It annoyed Jerry that others replace perfectly good equipment with higher capacity computers that are beyond their needs. Politically he liked the opportunity this gave him to be able to promote Linux open-source software.

Other tenants had been involved in refurbishing computers. Ash had given some tenant training and configured a few computers. They called in Phil (who is in full-time employment) if they needed a 'top-line' hardware expert. If they are in need of upgrade parts or peripherals that the surplus computers do not have, Peter knows where to get them cheaply. Typically he gets a job lot and some components work; some do not.

Jerry was unsure whether the others would say the same, but it pleased him to think that they would be close to achieving full access to the intranet on the estate. If they were to achieve tenant management, he thought this would be integral to making that possible.

The answer to the question about how many reconfigured computers they were doing on average was not simple. Although there was no shortage of computers, they worked on them irregularly. Jerry thought that they had delivered something like 100 working computers to tenants in the last year. Clive confirmed the total intranet-capable flats to be around 150 — a very significant recent expansion.

Teamworking at the council estate

For whatever reason, those at the council estate currently involved with the inclusion of tenants into the ICT network seem to work tolerably well as a team. When this was suggested to Jerry, he wanted to temper the idea. Paul, he said, is good at fixing critical systems failures. If the network goes down, many users complain (the respondent observer had witnessed similar events in the housing cooperative) and Paul goes out to fix it. But if someone's computer fails or is broken, it might take some time for someone to respond; they can be slow to fix what Jerry referred to as 'non-critical systems'. In phone calls, Claire (early 20s) related an experience of this voluntarism:

[My monitor is] still flickering on and off but not as bad now, so it means I can use it ... Hopefully someone's going to lend me a monitor to find out if it's the ... you know, it is the monitor ... but I think it is ... Clive's supposed to be lending me one, but he just hasn't got round to it yet.

Jerry wondered what they would do if Paul left, as none of the early 1990s originators of the network now lived on the estate. One had made money as an early ISP and had financed the set-up purchase of equipment. The same type of equipment now, Jerry said, is much less expensive and/or readily available. Others "who had planned and installed the system had moved on, and one had died. However, this loss of originators had not stopped the development of the community web use and now a new? 'team' is managing the expansion.

Paul fixes the network. He has a combined studies degree majoring in linguistics and has worked as a programmer. Jerry thought that Paul, like himself, had deliberately not taken full employment. Clive installs the cables.

He is very gregarious and therefore knows almost everyone on the estate. He refers to himself as 'the plumber', joining things and people together. The observations and the testament of others corroborated this perception. Clive was not in paid employment at the time of the research. Jerry painstakingly rebuilds secondhand computers that the team have located and installs the Linux software. He is self-taught in ICT and deliberately works only part-time in the city library. Mike does not have specialist knowledge but is enthusiastic to be included. He can be relied upon to work with Clive, Paul or Jerry in whatever they are doing for the network. Barry deals with the network's external relationships. However, much of his time is now taken elsewhere as a paid network consultant.

In terms of working effectively together as a team, Clive might be described as a coordinator and resource investigator, Jerry as an implementer, Paul as a specialist and Mike as something of a general worker in roles 'shaped' by Barry. In this way they play complementary roles. The time that Paul, Clive, Jerry and Mike have deliberately engineered for themselves constitutes the available slack that sets the council estate apart from the housing cooperative. To the extent that we felt each contributor to be fairly fully occupied in giving discretionary assistance on the estate, we might think of this as optimal slack.

When this good compatibility of the 'team' was discussed, Jerry mentioned how the individual members' strengths could work to their advantage in getting projects completed. Although Clive might not be highly skilled in all aspects of the software and hardware, occasionally he might be called on to do something in this line. This was because Clive knew people so well on the estate that he could arrange more easily to run cable through their flat or install a hub. Along with Paul's undoubted programming skills and ability to keep the network running, these three particularly seemed to have complementary strengths.

Users and the online offer

As each computer is rolled out, wordprocessing and email compatible, the council estate tenant mostly receives it free of charge. Thus the tenants' committee achieves one of Rowena Cullen's fundamental requirements: 'Affordable routine access is essential for participation in this new information age' (2001). The only exception to this is if the group have incurred any (usually minor) expenses in rebuilding it or the tenant has asked for particular features that have incurred costs. Potentially, therefore, each computer is custom built. Access to the intranet is free. This includes communications systems such as internal email and the notice-posting facility. For £5 per month, tenants get access to the internet. The ability to deliver low-cost access is central to the project, as Alice confirms:

There's absolutely no way I'd have bothered to invest in a computer ... taught myself the basic skills to use it. And then as a normal person in a normal house

paying the **normal**, erin, internet connection charge, I definitely wouldn't have bothered. It's because its come at such an affordable price.

Through the tenants' association newsletter tenants have been told that they can ask for help with any problem they may have, including ICT. Therefore, Jerry thought that ICT help was not just given through friendship networks. He gave an example of someone he had helped extensively and they had become friends, rather than having started as friends. Jerry assessed that about three-quarters of the new computer users do not return with problems. Help is available (often but not always swiftly) with fixing problems and extending the system to meet their wants and needs. About those who do ask for help, Jerry had many interesting stories of hours of mostly engaging voluntary work.

Helping networks at the housing cooperative

In summer 2002 the housing cooperative carried out a survey of its tenants and university researchers assisted with collecting the questionnaire. The aims were to assess levels of ICT skills, present a number of options that the new intranet could offer and ask what help tenants received or gave to others with their computer needs. A little more than two-thirds of the households in the housing cooperative responded to the questionnaire. We found a full ICT skill range from novice to expert among the residents. There was a generally high level of potentially accessible ICT skills both in terms of depth of knowledge and breadth of subjects.

Six findings are of particular importance to this article:

- 1 some tenants saw themselves as in need of help but unable to ask for it. Observations suggest that the reasons included the shyness of the young and self-exclusion through perceived social difference from others;
- 2 one resident felt disinclined to ask repeatedly about some continuing ICT problem;
- 3 some able ICT users 'have not been asked for help', but there is no reason to think they would not be responsive;
- 4 two apparently able users seemed to think they would have little to offer in helping others;
- 5 some able ICT users reported themselves to be too busy to help others; and
- 6 those with ICT abilities still report specific needs and these might include systems level and/or hardware advice and software that is new to them.

Previous conversations at the housing cooperative had suggested that, in this case, ICT help operated through friendship groups. In addition, it was

clear from respondent observations that some tenants were overloaded with requests for help while others remained without or with insufficient help. In particular one tenant, Cameron (early 30s), seemed to be called on more than any other for help. Although nominally there was a network committee, he was crucial to the network installation work.

What the survey suggested was that this friendship system left untapped resources both in terms of people willing to help and those who might be underestimating their usefulness. In this instance, one might say that some slack was available. In practice, the network team was overreliant on one person who was himself setting up a small business. Another member regarded the network with suspicion but worked long hours anyway, had childcare duties and little free time. Some other members were self-interested, merely wanting to connect themselves to broadband. Others had time but currently "were simply too unreliable.

Later that year the study delivered Pentium One computers ("without printers) to three single mothers on the estate. Within two months, all three had been given newer computers. Two came from friends who were upgrading and one was as part of a women's ICT skills course. An initial attraction was to be able to play with music programmes, like their friends. All three respondents learned how to email and two became fervent users. Initial enthusiasm "waned somewhat. One computer was stored for many weeks in a bedroom before being installed on the available intranet line. As the other computers proved unreliable, the respondents found that they needed support. In a telephone conversation, Jewel said:

It's broken, I'm just going to have to get someone in to look at it or something ...
Well, its quite daunting because people are busy ... but ask about one thing at a time.

In this statement, Jewel further confirmed the questionnaire findings and observational data that the discretionary time available to potential helpers was - or was perceived as - very limited.

Teamworking at the housing cooperative

As in the council estate, regular meetings of the ISP management group were held at the housing cooperative to progress internet provision. Key members brought particular skills. David chairs, coordinates members and prepares computers. Capacity to energize the project and upgrade donated computers vies with available time from paid work. Jason draws up the network. His architectural business makes it possible to produce CAD plans but leaves little time available to the project. Between two and five other computer-literate members contribute to meetings, but without specific roles. They all have outside, mostly full-time, employment. It is a key feature of each meeting that progress has been slow.

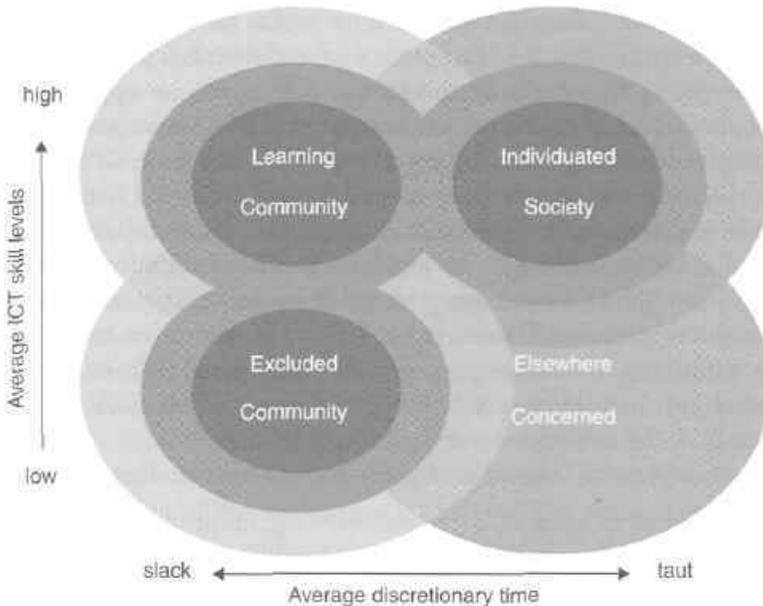
DISCUSSION

It is suggested that there is *a priori* evidence that many affluent communities tend to be (discretionary) time-poor. However, in general they will not be excluded from information technology and skills will be abundant. Often, these skills will develop outside their community. By contrast, the areas where people are excluded are likely to have relatively high levels of people not in work, either through lack of employment or other reasons such as retirement, e.g. sheltered housing community for elder citizens. This 'slack' is of little use in terms of the digital divide, since skills levels are likely to be low.

Therefore, in the light of this research, it seemed logical to consider the relationship between a community's average levels of ICT skills and discretionary slack (see Figure 1).

This plot suggests four theoretical but plausible conditions. Three of these presuppose some generalized interest in gaining ICT skills and one does not. We tentatively offer names and definitions:

- learning community — ICT skills are available in the social form required to facilitate learning, plus the members have time to learn;
- excluded community — while discretionary time is available, a lack of ICT skills means that any learning is likely not only to be restricted by access but relatively slow, and where it is possible, focused on particular interests; and



• Figure 1 Optimal conditions for an ICT learning community

- individuated society — while ICT skills are abundant, learning \vithin and across the community is restricted in terms of scope by a lack of discretionary time.

Brady (2000) offers a description of what could be regarded as instances of those with more pressing concerns when he says: 'Those who cannot [get wired] have bigger problems than not being able to get online'. In that sense we have a fourth category:

- elsewhere concerned — in an information society, we might expect individuals in locations characterized by low ICT skills and limited access to social support to focus on issues of everyday living to the exclusion of new skills that may seem irrelevant to their needs.

By blurring the edges in Figure 1, it is suggested that the boundaries between the 'learning communities'¹, the 'excluded', the 'individuated' and even those with other more pressing concerns may not always be clear. Those with other important concerns are represented against a more diffuse background since it is recognized that, in their case, inclusion in the digital world might not be the highest policy priority. This merging of the boundaries also implies that any kind of stability for these communities is not being proposed. The dangers of key figures moving away from the engaged communities have been pointed out previously. The 'elsewhere concerned' rapidly may become users of an ICT technology if a viable use is perceived and facilitators emerge, able to act on the opportunities presented, e.g. mobile phone 'kiosks' for public use run by local people (Cronin, 2004; Ross, 2004): shared use makes the technology affordable. However, it is argued that it is the presence of available slack within the community that allows the facilitators to capitalize rapidly on opportunity.

We attribute the relative success of including council estate tenants in developing web use to the availability of both skills and time. Consequently, we would refer to this as a learning community, in the wider sense that this is a network of people from differing technological backgrounds that enter into relations that are brought about by problems or shared ambitions (Heckscher and Donnellon, 1994); knowledge is shared from person to person, rather than through documents (Hansen et al., 2001). This seems less true of the housing cooperative. There are perhaps more "widespread skills in the cooperative but there appears to be less use of any available slack and, with respect to ICT, the tenants seem more individuated.

The more successful council estate, it is argued, has five discernible features:

- 1 an interest in what ICT can deliver — e.g. music and entertainment, interconnection especially for radical groups and communal safety;
- 2 considerable accumulated ICT skill;
- 3 considerable social skills;

- 4 complementary skills; and
- 5 flexibility and available time.

The first two conditions are also present in the housing cooperative. Most importantly, according to Mehra et al. (2004), Myles (2004) and Selwyn (2006), both groups have found ways of using and colonizing the web that make sense to them as individuals (LifF and Steward, 2001) and communities. Interests such as local politics and campaign contacts were clear motivators towards the use of the internet in these communities (see also music, books, baseball in Newholm et al., 2004). The third and fourth conditions provide the basis for efficient teamwork and are likely to be present in communities, but it is the fifth that gives the slack that allows them to respond in a discretionary manner to the needs of the tenants. To the extent that this successfully engages the tenants in ICT, we might refer to this loosely as optimal slack. This would not be remarkable, but for being able to imagine it to be relatively rare. Many 'communities' will have considerable ICT skills but little slack. Many 'communities' will have considerable slack but few ICT skills.

Although the residents within the communities reportedly had access to ICT courses, greater importance and value was attached to the local, friendly and flexible in-house assistance that the council estate is able to offer them and that Selwyn (2004) identifies as essential. One of the difficulties with the more formal type of support is that, as with other externally provided training, it tends to be accessible only during specific times and in specific places. In such instances, the delivery of training is determined by temporal and spatial limitations. The availability of help is unlikely to extend beyond 'traditional' working hours: the period during which many home users of the internet are likely to access and use their computers (see Doherty et al., 2003).

The context in which training and support is delivered is also of relevance here. As LifF and Steward (2001) argue, there must be a low access threshold and it should be provided within 'a context in which people feel comfortable about using it' (Liff et al., 1999: 2). Research conducted into barriers to learning for marginalized groups (Pierce, 2004), including transient people (Doherty et al., 2002) supports this notion. The former narrative illustrates how formal training can reflect the underlying causes of exclusion (e.g. use of difficult terminology) and thus fails to understand the worries of 'excluded' learners, reinforces their apprehension and heightens feelings of inferiority. The latter study indicates that members of such groups often feel inadequate and therefore uncomfortable approaching providers of formal educational courses. The respondents reported feeling 'intimidated' not only by the tutors, but by the formality of the institutions themselves. The same people reported feeling more comfortable and 'safer' accessing basic ICT skills within less formal and more familiar settings such as hostels, 'because that's like their community' (Doherty et al., 2002). Similarly, we reported instances where

respondents reported feeling uncomfortable or intimidated by some forms of institutionally-based training and support.

In addition to the temporal and spatial limitations of externally provided training and support, the current research pointed to limitations in terms of the content and delivery of help and advice. Some of the respondents' needs could not always be met by formal support that tends towards a course of instruction. Rather than structured training, the new users preferred targeted advice for a specific problem of interest to them that lets them overcome some immediate hurdle. However, it was also clear that both communities (to differing extents) have the appropriate structures in place (and in the council estate, the 'slack') to go some way towards addressing these issues. The respondents' stories indicate that these informal support networks, which were perceived as flexible and low effort, were able to provide help that fits individual user needs. Their popularity and effectiveness was apparent in the stories of help received.

While it is evident that informal support networks exist within both communities, the respondents perceived these differently as being either inclusive or exclusive. In the housing cooperative we conducted a survey of ICT support, which indicated that support is reportedly organized around friendships. The observations conducted in addition to this gave no reason to conclude otherwise. Because of this, ICT support was not entirely inclusive. The survey showed that some tenants identified themselves as in need of help but were afraid to ask. Indeed, one individual was concerned with repeatedly bothering others with recurrent problems.

The current research indicates that to a certain extent, informal support networks can be dependent upon the accumulation of 'social capital' (e.g. Warde and Tampubulon, 2002). Unlike the respondent who was reluctant to ask for help, the stories of at least three of the residents in the council estate suggest that they perceive the available ICT support to be inclusive and accessible. Some on this estate might be seen as members of existing 'offline' friendship networks, as they reported either being actively involved within organizations and/or groups that are linked to the community, or of having some personal connection with those providing the support; however, other stories showed that friendships followed assistance being given.

Similarly, not all needy tenants on the housing cooperative felt excluded from ICT help. One resident said that his position within the cooperative, as an active member, ensured that he could draw upon ICT support as and when he required it. He viewed himself as 'fortunate because I [have] mates around, you know, Cameron and such persons', should he encounter any technical problems.

CONCLUSION

The 'optimal slack' model of ICT development we have described at the council estate as a learning community might be partly fortuitous and partly

engineered. Nevertheless, it suggests an additional way of addressing the digital divide in excluded and individuated communities. It directs us, as Duncan Campbell (2001) concludes, towards capacity-building. In accord with the very different context, formally constituted e-gateways, studied by Liff and Steward, the current study confirms the value of skills other than directly in ICT (see 'communications skills', 2001: 330) and the considerable significance of discretionary time (see 'non-directed interaction', 2001: 338). Thus future policy initiatives might include the following.

- Where there are skills in a community (including and especially 'offline' social networking), release time for these people to operate within their communities.
- Where ICT skills are low, capacity-building and delaying take-up of demanding jobs for those with ICT skills in return for further in-community capacity-building.
- Where communities lack residents with social networking skills, these might be counted as essential to any recruitment for capacity-building.
- That the development of ICT skills be integrated into the community fabric rather than provided by external sources.
- That support is available on a flexible basis as if provided by 'friends' or those who belong to the same inclusive social network.

We see these proposals as a contribution to the 'second phase, bottom-up' (Selwyn, 2006) approaches to inclusion. These, it is argued, require potential slack (see Geiger and Cashen, 2002) explicitly to be made available within a staged developmental approach implied by Cullen (2001). Simply changing the training and help available through more formal sources (although constructive and desirable) is insufficient. Rather, a reconfiguration of that help is needed. The respondent stories illustrate that the kind of flexible, accessible, relevant and targeted assistance available through community members with 'slack' can differ quite markedly from more formal provision. Discretionary slack is the palpable difference that makes the help more appropriate, useful and, arguably, more inclusive and successful. Thus, it is argued that a degree of slack in a community can improve the possibility that support is available when needed to facilitate learning at any competence level, and perhaps create opportunities, on an agenda set by the user. Success is not guaranteed; the possibility of inappropriate informal help has been acknowledged here and, as Selwyn et al. state (2006), the 'micro-polities' of everyday relationships can be detrimental. However, the converse, an abundance of skills without slack, clearly impedes inclusion.

Our interpretation of these data suggests that the contemporary focus of research on social networking as a key factor in ICT knowledge transfer is warranted. It is argued that future research might pay particular attention to: mundane networking, in the sense of facilitating contacts and building relationships; our understanding of the relationship between available skills,

time and learning within communities; and the relative value of demand lead learning, the apparently successful process presented Here, and planned training in ICT.

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Notes

- 1 We refer to these as 'self-help' communities because the initiative, some of the money and the labour required to encourage tenants online, have come from groups of tenants within the community itself
- 2 This refers to housing (typically high-density) built with public money and managed by the local government for the area (the council), who are effectively the landlords.
- 3 We refer to a 'team' where we want to differentiate between the groups organizing the ICT networks in a more or less effective way, and residents' wider informal friendship 'networks' in and beyond their residential community.

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