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ICTs and technical agency: A case study of a rural Brazilian community

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Abstract This paper explores the role of ICTs (Information and Communication Technologies) in rural, marginalised communities. We explore Feenberg's concept of technical agency in order to understand the ways in which technological capacity might contribute to community development. We discuss three conditions of technical agency as outlined by Feenberg; power, knowledge and appropriate occasion. We consider how this framework might enable an approach to understanding the role of ICTS in the particular social-spatial contexts in marginalised communities. In order to test Feenberg's approach we discuss a case study of a village in rural Brazil: Noiva do Cordeiro. The community is recognized regionally as a pioneer in the way that it has mobilized a range of ICTs for the benefit of the community. We will conclude by discussing how ICTs can reinforce existing or introduce technical agency in a Feenberg framework and how this might contribute to community development.

Introduction

The correlation between technological advancement and urban development has been discussed by a number of theorists in terms of the physical, social, economic and political factors (de Sola Pool 1990, Sassen 1991, Graham and Marvin 2001, Amin 2002, Graham 2004, Massey 2004, Swyngedouw 2004, Castells 2011). Technology and urban development are often perceived as complimentary, and as such technological frameworks and social structures are often understood as interlinked. According to Graham and Marvin (2001), technological networks are systems that help to shape the urban environment since 'as capital that is literally 'sunk' and embedded within and between the fabric of cities, they represent long-term accumulations of finance, technology, know-how, and organisational and geopolitical power (2001: 12). Latham and Sassen (2005) introduce the concept of socio-digital formations to address this intertwining of social and digital structures. These are 'electronic information and communication infrastructures

resulting from various mixes of computer-centered technical capabilities and the broad range of social contexts that provide the utility logics, substantive rationalities, and cultural meanings for the particular types of digital interaction involved' (Sassen 2006: 208). Socio-digital formations are shaped by social, political, economic, and even visual structures, which help define 'novel social forms' through the juxtaposition of new forms of organisation, interaction and electronic space (Latham and Sassen 2005: 2).

Yet, despite the focus on how ICTs contribute to urban transformation, there is a less understanding of how ICTs are embedded within the particular socio-cultural contexts of marginalised communities. The growing field of Community Informatics (CI), situated in the intersection between the social and the technological, represents the increasing recognition of the role of technology in enabling and empowering community processes (Gurstein 2007: 11), particularly in developing world contexts. Within CI there is a general understanding of the political character of technology, because 'sociologies of connectivity are predicated upon the architecture of networks, since the architecture governs positionalities and relationships, determining who has power, who can exercise control, and who is included' (IT for change 2014:31).

The problem we seek to address is how ICTs can benefit and empower communities that are marginalized. We characterise marginalization according to Demo as 'the inability of a given community and its individuals to mobilise within the various spheres of individual and communal life' (Demo 1994). This includes communities that are in some way socially, economically or geographically excluded from mainstream society. Marginalised communities are often recognised as those that could benefit most from access to ICTs in order to address issues of geographic and economic exclusion (Unwin 2009; IFAD 2003). However one of the underlying problems of the role of ICTs in community development is that increasing technological access to ICT networks such as those characterized by Castells (2007), actually contributes to the perpetuation of existing divides. This is because access does not in itself overcome the broader challenges of the lack of technical skills, poor economic opportunities and existing democratic divides (Mosberger et al 2003). ICTs can never be a simple counter to marginalisation because even when technology is made available to marginalized groups; 'what usually happens is inclusion in the margins; they may be a little but more included, but they continue to be marginalised' (Demo 2007: 06). In fact in many cases the introduction of ICTs in marginalised communities leads to the reproduction and reinforcement of existing social relations and power relations (Mbarathi and Diga 2014). That is because the communities involved often lack the circumstances and the understanding of the importance of technology for empowering themselves either as individuals or as a collective: they lack agency.

This can be seen in many of the current strategies that seek to overcome digital exclusion in developing countries. A large-scale example is the One Laptop per

child (OLPC) project¹. The OLPC project, championed in the mid-nineties, aimed to develop low cost, resistant, open-source computers in order to ‘empower the world’s poorest children through education’². Different physical constraints were taken into account when the piece of hardware was developed, nevertheless, the project still neglected many of the social, cultural and political dimensions associated with the contexts it was to be deployed into (Willoughby 1990). For example despite being open-source and low cost, the project still struggles to provide access to technology, because the lack lies in the access itself (Souza 2009). What OLPC failed to provide was the training (both of the users and the educators), resources for maintenance and technology suited to the contexts in which it was to be used. The OLPC project demonstrates that technology provision alone is not sufficient to overcome the socio-cultural divides that underpin and reinforce the lack of access to digital technologies (Mosberger et al 2003, Baltazar 2009; Melgaço and Baltazar 2011).

In the next section we discuss the role of ICTs and technical agency to support and develop collective agency in order to counter economic, social and digital exclusion. We first discuss the political dimension of technologies and the implications and outline Feenberg’s concept of technical agency. The three conditions for Feenberg’s technical agency are discussed; power, knowledge and appropriate occasion. This is contextualised in a case study, where we study a rural community in Brazil, Noiva do Cordeiro. The village was chosen because, although it might be characterized as marginalized, it has adapted ICT use to address the needs, skills and specific socio-spatial context of the community. We explore how ICTs have affected the community in terms of its everyday practices, and the consequent implications of this for an understanding of their technical agency. In the summary we draw together the theoretical framework and the findings from the y case study to reflect more generally on ICTs in marginalized communities beyond the Brazilian context.

Technical Agency

The issue of what constitutes ‘access’ to ICTs is often dominated by a narrative around ICTs and their socio-cultural context that focuses on ‘how’ technology can be used and not on ‘why’ it’s use should be developed with regard to its helpfulness to people’s everyday lives (Flusser nd; Thackara 2001). The focus on a ‘how’ rather than a ‘why’ underlines a technologically deterministic approach in terms of the technology and the impact on people’s social lives. According to Feenberg ‘determinism claims that technologies have an autonomous functional logic that can be explained without any reference to society’ that is based on an approach to

¹ <http://one.laptop.org/>

² <http://one.laptop.org/about/mission>

technology that sees it as universal, decontextualised and self-generating (Feenberg 1999: 77-78). He argues that technological development needs instead to be understood as a social process, a site of social struggle or a Latourian ‘Parliament of the things’ (1993) on which political alternatives contend. Feenberg’s approach is to argue for an understanding of the political dimension of technology, and thus to consider the concept of ‘technical agency’ or ‘technical citizenship’ (Feenberg 2011). In this context, Feenberg argues that ‘either politics becomes another branch of technology, or technology is recognized as political’ (1999: 02), which he defines as political action within the technical domain (2011). This acknowledgement of the political dimension of technology means that it must be defined contextually and locally by the particular technology/society relationship, and that technology can never be removed from a context, and therefore can never be neutral (1999: 213). In this chapter we work with Feenberg’s theories around the democratization of technology, and in particular his concept of technical agency.

The political nature of technology is particularly important to understand within the context of the challenges faced by marginalised communities. It is important to note, that physical availability of computer and internet do not correspond with access, as discussed in the OLPC project above, since access requires skills, opportunity and ‘technical agency’ to mobilise these skills within a given context. According to Gurstein, rather than responding to the ‘digital divide’ by extending opportunities for technology or Internet access the approach should instead focused on ‘finding ways of using ICTs to respond to issues and requirements that are meaningful and significant in the daily lives of individual users within their communities’ (Gurstein 2003: 34). Whilst access to ICTs opens up ‘the number of discourses and subject positions to which the individual becomes exposed, as well as by multiplying the participation forms available at the individual’s fingertips’ (Bakardjeva 2009: 94), Feenberg argues that it is only socially compelling when those individuals who use it have the agency or the ‘capacity to act’ on it, and most importantly, beyond it (Feenberg 2011). This considers technology and its various applications based on local knowledge and actions that address local problems when top-down strategies fail (Feenberg 2011). According to Feenberg technical agency depends on three conditions: knowledge and power, and an appropriate occasion (Feenberg 2011), which we expand on below:

Knowledge

Feenberg identifies two sorts of knowledge: that related to technical issues which he defines as a ‘specialised knowledge’, and that which comes from experience, which he calls a ‘knowledge from below’. In the technical domain, these two forms of knowledge usually conflict, since specialists tend to overlook the needs of those affected by the technology (Feenberg 2011).

Power

Feenberg (2011) describes power in relation to how people can work with technologies in a way that is appropriate to their own needs. Through such appropriation they also empower themselves and their community. According to Feenberg:

‘involvement with a technology makes certain interests salient [...] Once enrolled in a network individuals are motivated to address its failings and in some cases they also acquire potential power over its development. And the power of individuals within a network is quite different from that of individuals who have no connection to it. Because they are on the inside they can identify vulnerabilities and bring pressure to bear.’
(Feenberg 2011:05).

In Feenberg’s thinking power instead equates with being empowered.

Appropriate occasion

Appropriate occasion is seen as circumstances in which the application of knowledge and power makes sense (Feenberg 2011), and refers to favorable circumstance in which knowledge and empowered citizens may enact social transformation. Appropriate occasion in this sense, means not only the point at which technical agency is enabled, but also the circumstances that allow for community members to appropriate ICTs for their own benefit.

In the next section we introduce a case study of particular marginalised community in rural Brazil, and in the discussion we will work with these three conditions to explore the political dimension of technology within the everyday local practices of the community.

A Case Study of a Rural Brazilian Community: Noivo de Cordeira

Noiva do Cordeiro (Noiva) is a rural community of around three hundred people on the fringes of Belo Vale, situated eighty kilometres from Belo Horizonte, the capital of Minas Gerais, Brazil (see Fig. 1. and Fig. 2.). It can be characterized as marginalized since it can be considered to experience economic, social and spatial exclusion. Economically it is a subsistence community with basic farming as a source of income, and for many years in the last century the village experienced food poverty. The community is geographically isolated, as the closest town, located sixteen kilometres away, can only be reached by a dirt road. There is only very limited public transport.



Fig. 1. Noiva do Cordeiro. (Source, <http://escrevalolaescreva.blogspot.com.br/2014/08/guest-post-difamacao-de-noiva-do.html>)



Fig. 2. Noiva do Cordeiro community. (Source: Based on Zerlotini 2014).

Historically the village was socially isolated for a long period of time. The settlement formed in the 1870's when a local family was excommunicated from the nearest town. Subsequently the founders of the community of Noiva do Cordeiro

established a settlement on the family's farmland, and was forced to be entirely self-sufficient for over a hundred years. The community started to re-establish connections with the wider community only in the last decade of the twentieth century. As a result of this extended period of social isolation Noiva developed a fairly unique social dynamic, where the village operates as a collective.

In the community, there is very little social hierarchy, and work is organised and managed collectively. All the resources, work and spaces of the community are shared; from childcare and clothes to housing and farming activities. Decision-making is also collective and any decisions are made through meetings with all the inhabitants present, as 'only a few cannot decide for all' (2013). The community ethos is based on the approach of 'all for one and one for all' (in Portuguese: todos por um e um por todos) in the sense that people do not think and act individually, but collectively. The community is economically self-sufficient with local people relying primarily on subsistence agriculture and some tourism, as well as some more recent entrepreneurial initiatives. Everyday life is primarily organised by the women of the community, since almost all the men commute to work in nearby cities and are absent during the week.



Fig. 3. Noiva do Cordeiro and the collective and meeting spaces. (Source: Based on Zerlotini 2014.)

The collective nature of the community extends to the spatial organisation of both housing and communal activities (see Fig. 3 for list of buildings and functions). The village has around twenty housing units mostly in shared living spaces, with residents living either in three collective houses (the 'Mother house', the 'Yellow house' and the 'Big house' where a nursery is also located) or in other extended family units. The construction of new units is discussed in group meetings and, final consent is then given by D. Delina, the community matriarch (Zerlotini 2014). The 'Mother house' is a central space in the community and is both home to the village matriarch and several other inhabitants as well as being a more general meeting space. The collective division of the household work has led to the creation of equally collective spaces for laundry, cooking, babysitting as well as

for group meetings, cultural activities and sports. These meeting spaces include a telecentre (located in the 'Big House'), a community centre where most activities and meetings take place, and a communal kitchen (see Fig 3). These locations also support a range of social activities, including theatre, dance and computer classes that are all organised by members of the community in their own time.

Case study method

The community was studied longitudinally through the years of 2012 and 2013 (Baltazar 2013; Kapp 2013; Melgaco 2013; Melgaco 2013a; Melgaco et al 2013, Zerlotini 2014;). An ethnographic approach was taken, based on different field visits and interviews with core members of the community. The community is careful to control how it is presented externally and does not allow researchers to digitally record interviews³. Therefore all references to quotes are derived from the researcher's written record of the conversation.

Results: ICTs in the Community

Partly as a result of the social isolation, but also due to the small size and isolated geographical location of the village, Noiva had very limited communication infrastructure or access beyond the community until 2005. The only form of communication infrastructure in place was basic landline access, with no mobile phone or internet access. According to a village inhabitant

'Until 2005, we had no contact with anything. We were an isolated community in the world' (Pereira 2014).

Around this time, the community actively set up a number of initiatives that would counter this marginalisation, primarily on the basis of ensuring the economic viability of the community. Overcoming the social isolation they had experienced up until the previous decade was recognised as a key goal by the community, since:

³ In fact the community has experienced a number of problems in how visitors who have been given access to the community have subsequently portrayed them. Its unique social structure has given rise to misunderstandings and misinterpretations by journalists and researchers. For example in 2009 Brazilian Marie Claire (Cerenza 2009) ran a story about the village and characterized it as a community of lonely women looking for love. This was picked up on by a number of articles in the UK press in 2014 (Bowater 2014; Roper 2014) that presented an entirely false view of the community. This caused a great deal of distress in Noivo and therefore the community took steps to actively control how they are presented externally.

'The fact that we lived isolated harmed our communication with outsiders. The community had difficulty interacting and experienced economic and educational problems' (Pereira 2014).

This included the installation of a range of ICT infrastructures, establishing communications networks with the world beyond the village and finally building digital skills through training and access to computers. Since it was the first rural community in the state of Minas Gerais to have this infrastructure, the community became widely known as 'rural pioneers' in the field of ICTs. Below we outline the initiatives undertaken under three categories; ICT infrastructures, communication with and beyond the community and finally ICT skills and training. These three different approaches combined have not only ensured ICT access within the community, but have led to a technical agency that supports and develops the economic and social life of the community.

ICT Infrastructure

In 2006 the community successfully set up a telecentre through a pioneering partnership between the government, the village community association and CDI (Committee for Democratisation of Technology), a non-profit organisation that provides ICTs to underprivileged communities. This was the first such computer school in the State of Minas Gerais. The telecentre is called the Center for Inclusion and Development of Community Education (CIDECE), and was used as a pilot project and similar telecentres were built in other towns in the region.

Some inhabitants were initially given training by the CDI, but the knowledge was soon shared within the community. Initially they used the newly introduced technology to collectively plan, manage and distribute the supplies from the subsistence farming. The telecentre is a room equipped with eight computers. As with other collective spaces in the community, it is collectively run and people voluntarily help one another with technical problems and training.

An inhabitant recalls the training sessions given to people when the internet was installed. During this period people had to learn to use the computer. Élidea remember he had never seen a computer before, and then:

'suddenly it was there, right in front of me'

Although the community negotiated the introduction of the telecentre, it did not have internet access. In 2008 the community worked together with the Vale Foundation⁴, a national organisation that works of social, economic and environmental empowerment projects to install the internet for a year in the community. According to one inhabitant, Cinammon, he remembers that the person who installed the Internet who told him

⁴ <http://www.fundacaovale.org/en-us/a-fundacao-vale/Pages/default.aspx>

"Now you have the world here."

Initially he was not impressed and his reaction was:

"I thought: what?!? But at this time the internet was very slow, and people did not use as much" (Cinammon 2013).

In 2011 the internet was installed permanently, from GESAC (the Federal government) which ensured a stable, internet infrastructure and reasonable speed of connection.

In 2013, a similar pioneering initiative resulted in the installation of a mobile phone repeater mast that enabled the community to have mobile phone access. The community funded this entirely through local contributions, which was made possible due to the collective structure where all inhabitants contribute equally to village projects. The provision of mobile phone access has had a significant impact on the community. Prior to this they had only one landline pay phone that was often not working. In a field visit a resident reported:

'It is working very well, and now everyone has a cellphone. Before we had the cellphone mast people would call on the phone, but often it did not work and we couldn't connect to the caller'

The provision of internet access, a telecentre and a mobile phone repeater mast, all of which were fairly unusual for a village of the size and location of Noivo, enabled a range of other activities related to the economic and social inclusion.

Knowledge networks

One of the key impacts of the introduction of mobile phone infrastructure was the new capacity of local people to use mobile phone communication to support knowledge exchange and development within the village. Currently, almost everyone in the village has a mobile phone, though their primary use is not for voice calls, but for texting. Mobile phones are less used for everyday chat and more for coordination of shared activities. Texts are used to organise collective activities such as the harvest, whereas prior to this, locals had to go knocking from door to door to gather people together. For example, Eliane, a local inhabitant, explained that the mobile phone is used 'for everything'. She added that:

"Now, when you have something important and last minute for example, when someone cannot go to D. Matozinha [a village elder], or when you have to organize a task force to harvest anything like that today they connect quickly and everyone knows. Before we had to knock on the door- it was tiring and inefficient.'

As part of the community's effort to become economically self-sufficient they also adopted an entrepreneurial approach and started up a series of micro-industries. In 1999, the community mobilised its traditional skills in sewing and needlework to start a small-scale lingerie business as a means of generating exter-

nal income. Initially the residents travelled to the nearest city of Belo Horizonte to sell the products door-to-door. But the introduction of the internet and mobile phone improved access to communication networks, that resulted in the possibility of products not only being sold locally but also through the internet (Erlotini 2014). In addition, a web site was set up⁵ to sell goods online to a national customer base. Even though most of the village women have never travelled beyond the state of Minas Gerais, the community also uses the internet to research global fashion trends. For the business, mobile phone access was also important for sales at local markets and fairs. These require a lot of coordination, and it meant that the women who attend the fair can organise things prior to the fair, and when they attend the fair they can ring back to the village if needed.

The community is very aware as to the importance of access to information as a way of acting locally but maintaining links to the wider world. This is critical for keeping knowledge within the community. In a conversation, Élide described the importance of the internet, particularly in terms of keeping the young people from moving away:

‘Noivi is "our paradise" but they [the young people] need the technology. They need it to seek information, to discuss new things, to do research. My perception is that they intend to stay here with that communal way of life, but they remain tuned in what happens out of there.’

Appropriate contexts for ICTs

In the initial process of bringing internet to the community local people were asked how they could use the technology for the development of the community. A key issue that emerged was the potential for the farmers. For example, a tractor driver envisioned how it might help calculating the cost of fuel and a farmer saw the potential in the possibility of knowing the price of produce in the nearest city. As part of a process of appreciating the capacity of the technology to support their livelihood, villagers realized the importance of technology for the management and organisation of the food production in the community. Therefore farming became one of the key activities that the community identified where they could use ICTs to act more productively. Following the installation of the CIDEC local inhabitants used the newly introduced technology to collectively plan, manage and distribute the supplies from the community’s farming activities.

A further way in which the community has developed quite specific ways of mobilising is through the ways in which they gather together for decision making and socialising. Community events are generally not one-off occasions, but a series of regularly organised meetings and festivals that take place at a range of different times and locations. Although the primary focus is on face-to-face contact,

⁵ http://www.bhmoda.com.br/index.asp?c=289&m=4&hiper=1&cod_pagina=18777&pag=1

ICTs are used during the organisation of each of the events. For example, every Saturday the inhabitants of Noiva gather together for the 'Night of the Viola'. This new weekly 'tradition' was introduced as an opportunity for people to gather together socially but also as a forum in which to discuss important issues in the community. The event provides an open platform for discussions about issues people feel are relevant to the community; topics range from everyday matters such as farming to more contentious issues such as homosexuality and abortion. Such events (occasions) provide a valuable platform for knowledge sharing and development.

Discussion: Power, knowledge and appropriate occasion

In this section we discuss the correlation between ICT appropriation and everyday practices using as a basis the conditions underlined by Feenberg for technical agency: power, knowledge and appropriate occasion. In doing so, we aim to demonstrate the appropriateness of such conditions within the context in which we are working through a discussion of each of his conditions.

Over the last decade the introduction of the telecentre (CDEIC), the ICT training within the community and the installation of the mobile phone antennae have contributed to a significant change in both the everyday practices and the overall organisation of the community. From a point of almost complete social and economic isolation, Noiva has acquired a range of ICTs to improve agricultural practices, and invest in cultural activities. Their village's unique societal structure has enabled them to broaden their connections with the wider world both online and offline. In many ways they can be considered to have empowered themselves, and ICTs have been one of the ways in which they have mobilized a 'capacity to act' or technical agency according to Feenberg's definition⁶.

Power: Mobilising ICT infrastructure

Up until about 2005, even basic ICT availability was very limited; public pay-phones were often faulty, individual phone lines were prohibitively expensive and internet access was non-existent. Mobile phones were also not available due to both the inadequate infrastructure and the cost of the service. This situation reinforced the marginalised position of the community, as the village was not accessible through either the transport or information infrastructure. Collective community action was critical to securing access to ICTs. Firstly, in the partnership with Vale Foundation, CDI and the government which provided informatics training and later on, internet access, and secondly, in the collective funding of the mobile

⁶ There is one aspect of the way the community acts that we do not deal with directly; that of gender. With the men of the village absent for much of the week, the community is organized and run primarily by the female inhabitants. Although we consider this to be a significant factor in how the community has developed a capacity to act, we do not deal with this directly here.

phone antennae. The community not only actively engaged in bringing the infrastructures to the village, but did so in a way that is appropriate to their own needs. In Feenberg's thinking power instead equates with being empowered, and so through such appropriation they empowered their community. The important aspect of how they brought in the infrastructure was that they did so within existing networks of power; those of the telecoms providers and local governance. The manner in which the community operates as a collective enabled them to mobilise coherently behind such decisions, and for instance collectively raise the money to pay for the mobile phone repeater antennae.

Knowledge: Mobilising knowledge networks

Noiva has sought to diversify and apply formal knowledge to reinforce their own experience; 'the knowledge from below'. Community members have used internet access to diversify the economic activities that link them to the outside world, and also provide additional sources of income. For example the products of the lingerie business, run by the community, are sold locally and on the internet (Zerlotini 2014). Through the telecentre, in particular, the community can access the internet as a knowledge-building tool, as well as use it to develop new tools to support community social events and networks. This effectively combines two sorts of knowledge as outlined by Feenberg: that related to technical issues which he defines as a 'specialised knowledge', and that which comes from experience, which he calls a 'knowledge from below'. In the technical domain, these two forms of knowledge usually conflict, since specialists tend to overlook the needs of those affected by the technology (Feenberg 2011). A further example is how the community re-imagined its farming activities through ICTs, where both computer skills and mobile phone communication are used to open up capacity, particularly at key times such as during the harvest.

Appropriate occasion

The community has created a range of platforms through which they can mobilise ICTs for the benefit of the community. This includes the telecentre, which is used to manage farming activities as well as the community social gatherings that provide a framework for collective knowledge sharing and decision-making. These 'occasions' provide the circumstances in which the application of knowledge and power makes sense (Feenberg 2011), which according to Feenberg is critical to enacting social transformation. Appropriate occasion in this sense, means not only the point at which technical agency is enabled, but also the circumstances that allow for community members to appropriate ICTs for their own benefit. A final condition, and one which is less salient, is how agency is enabled through the collective use of space in the community. Community spaces have specialist functions; such as a kitchen, a meeting space and a telecentre but are each collectively owned, run and managed. In fact the combination of multiple activities located

within a series of central spaces has meant that social ties are constantly reinforced through contact. The community places operate as part of a dense network of social and spatial resources. Community spaces such as the telecentre are centrally located spatially and ICTs are successfully embedded within these spaces. ICTs are not seen as technological devices but are accessed based on how they support and enhance community activities and needs. The shared ownership of the space is also reflected in the shared responsibility for ICT infrastructures and devices, such as the collective procurement of the mobile phone antennae. For Noivo, the sense of the collective, at a spatial, social and economic level, provides the circumstances through which appropriate occasions are enabled through ICT use.

Summary

The pervasiveness of ICTs in urban settings has meant that much of the current discussion focuses on cities and cutting-edge technologies, with the consequence that the role of ICTs in rural and marginalised settings is often overlooked or misunderstood. Yet, these contexts have the potential to benefit from ICT use and to overcome conditions of economic, social and spatial exclusion. We discussed Feenberg's concept of technical agency in terms of how a community can use ICTs to mobilise change within their everyday lives. We introduced Feenberg's three conditions for technical agency in order to systematise an analysis of ICTs; knowledge, power and appropriate occasion. We discussed a case study of a small rural community in Brazil, and investigated the role of ICTs in community development through the lens of technical agency. We outlined how Noiva do Cordeiro uses ICT infrastructure to communicate and share knowledge more effectively and also to support activities appropriate to their own context and activities. In this way, they have supported their capacity to act (technical agency), and access to the internet and mobile phones have been used to counter their geographic and social marginalisation. This has been achieved in a range of ways; through collective empowerment such as mobilising to collectively install ICT infrastructure, through their active use of ICTs within spaces such as the telecentre for knowledge sharing both locally and globally online and through creating appropriate occasions for how they mobilise knowledge within these power structures.

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Bios

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Katharine Willis research over the last decade has explored the effects and implications of digital networks on the experience and design of urban space and place. She has authored and edited over forty publications on these themes. Her most recent book is *Netspaces: Space and Place in a Networked World* (Ashgate Press 2015). Other recent books include: 'Locative Media: Multidisciplinary Perspectives on Media and Locality' (co-edited, Transcript Press 2013); 'Shared Encounters' (co-edited, Springer 2010) and 'Mediacity: situations, practices and encounters' (co-edited, Frank and Timme 2009). Katharine Willis trained as an Architect with a Masters in Architecture from the Bartlett, University College London. She has a PHD from the Bauhaus University of Weimar, Germany where she was an EU Marie Curie Fellow in the MEDIACITY research project. Since 2011 she has been based in the School of Architecture, Design and Environment at University of Plymouth, UK, where she is Associate Professor (Reader) in Digital Environments.

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