

ANALYSING ICT AND DEVELOPMENT FROM THE PERSPECTIVE OF THE CAPABILITIES APPROACH: A STUDY IN SOUTH BRAZIL

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ABSTRACT

Certain international agencies propose that Information and Communication Technology (ICT) allows development to be reached more efficiently and quickly. While there are success stories galore, there is acknowledgement of not all investments in ICT bringing positive effects towards development. Following the Capabilities Approach, this paper discusses how the use of ICT can promote a more effective development by studying the case of Sudotec (association for technological and industrial development), a non-profit organization that saw in ICT the opportunity to change the local scenario. The results revealed positive effects of the use of ICT in social, economical and cultural spheres, but not presenting political effect.

Keywords: Development, Information and Communication Technology, Capabilities Approach, ICT4D, Case study, Brazil

1. INTRODUCTION

The potential for development and the effects of the diffusion of Information and Communication Technologies (ICT) has been the focus of studies in emerging countries (Avgerou, 2009; Heeks, 2010; Pozzebon and Diniz, 2012). Constantly, studies on this theme are based on the premise that ICT can contribute towards an improvement in socio-economical conditions in developing countries (Mann, 2004; Sahay, 2001; Walsham et al., 2007). In most cases, the potential of ICT for development has been implicitly assumed for specific research purposes, ranging from proper technologies implementation for developing countries, by means of the facilitation of the diffusion of technologies (Kraemer et al., 2009), to understanding of institutional changes needed for the development of a given community (Ma et al., 2005) or being a differential for the performance of small and medium enterprises (Vries, 2010). Researches on Information and Communication Technologies for Development (ICT4D) are based on the belief that ICT has, potentially, the capacity of contributing towards the improvement of various aspects of life, from the reduction of poverty to the strengthening of democratic politics (Avgerou, 2010).

However, the application of ICT has not always been successful. There are many examples of complete or partial failures (Avgerou and Walsham, 2000) showing that efficacy of ICT as a decisive factor for development is not unanimous among authors. Over ICT4D are two visions, one progressivist and other disruptive (Avgerou, 2010). Nevertheless, the greater understanding is that ICT allows development while reducing poverty, enabling less favored groups and improving governance (Kanungo & Kanungo, 2004). Some defend that ICTs are a luxury for needy regions or an imprint of a relation of power (Sorj, 2003; Thompson, 2004).

Still, access to media has been seen as an alternative for improving the quality of life of citizens, provided by the exchange of knowledge and increase of the relationships among people, groups and nations. This implies the need for initiatives to leverage connectivity, to provide access to ICT, to improve human capacity and to boost development (ONU, 2000), and, also, some authors argue that only deliver infrastructure is not enough, presenting that there is a need to increase the management processes (Avgerou, 2010; Cunha and Miranda, 2013; Heeks, 2010).

Considering the above and following Sen's Capabilities Approach (Sen, 1980, 1989, 1993, 1999), this paper investigates how local development can benefit from ICT, based on a case study of Sudotec (an association for technological and industrial development in southwestern Paraná, Brazil), a non-profit entity that saw on ICT an opportunity to change the local scenario. This paper aims to discuss how the use of ICT can bring about a more effective local development. One of the main contributions of this work lies on providing a theoretical structure that can be used in future studies, as well as in how implications for development professionals can stimulate initiatives towards effective development.

This paper is structured as follows: firstly, approaching concepts regarding development as freedom, unfolding in relations between ICT and development. Secondly, describing the case of Sudotec. Thirdly, analyzing data and discussing results. Finally, concluding with a reflection on the implications of our choices for a better understanding of this particular case of ICT for local development.

2. ICT4D AND DEVELOPMENT APPROACHES

There is a growing literature on ICT in developing countries (Avgerou, 2009; Pozzebon et al., 2011; Walsham and Saray, 2006). Understanding ICT4D as an issue of development has had rapid evolution. Since the United Nations outlined its Millennium Development Goals in 2000, many international development agencies began to dedicate resources to the deployment of technologies in developing countries, generating the ICT4D movement (Diniz et al., 2013). This is a key factor not only at macro level of globalization, but also at the micro level, where increasing use of cell phones, for example, has changed the communication patterns worldwide (Pannu and Tomar, 2010). In this sense, ICT4D can be defined as information and communication technologies whose adoption or impact support the development goals (Heffernan et al., 2012).

However, a number of researchers (e.g. Heeks, 2006; Thompson, 2008) point out that a great part of this literature does not approach the matter of what is understood as development. Heeks (2010) argues that the true attention towards understanding the contributions of ICT for development must be found in the results. Thus, research involving ICT and development is often focused on specific objectives regarding development, such as the enhancement of subsistence means in rural areas (Beuermann et al., 2012; Duncombe and Heeks, 2002), or programs implanted by the government (Lin et al., 2009; Krishna and Walsham, 2005; Qvortup, 1995), and seeks to understand the effort needed for the implementation of ICT and for organizational changes to successfully occur, providing the expected benefits. However, confronting complex challenges and policies of efforts on development, it's necessary to assume a critical posture in the role of ICT for this purpose (Avgerou, 2010). The policy direction needs to be towards the establishment of an information infrastructure and a contingent perspective for the policy process of designing appropriate information technology infrastructures (Korac-Kakabadse et al., 2000). Moreover, any research that attempts to situate the disputed intellectual space that is "development" needs to locate and understand what development perspective will be followed (Kleine, 2007).

There are several approaches to development and the concept is in constant discussion and revision, as there is no common definition among authors. Debates on development studies vary among economists that associate development with economic growth, with income being measured by gross national product or per capita income (as Lewis, 1954; Myrdal, 1957, Hirschman, 1958; Rostow, 1960), those who argue that dependency and inequality are inherent to capitalist development (as Frank, 1967; Blomström and Hettne, 1984; Kay, 1989). The alternative development ideas, recognizing the social and environmental goals as well as the economic ones (as Nerfin, 1977; Chambers, 1983) and radical critiques “post-development”, which often completely reconstruct the concept of development (e.g., Escobar, 1995; Arnhem and Bawtree, 1997). In this latter stream, the most influential challenge to the mainstream of development came from Capabilities Approach of Amartya Sen (CA), where development is defined as “a process of expanding the real freedoms of individuals” (Sen, 1999, p. 3) to “lead the lives they have reason to value” (Sen, 1999, p. 293).

For Amartya Sen (1999), development can be seen as a process of expansion of real freedoms that people enjoy, associated with freedom of choice in personal, social, political and economical spheres. According to the author, GDP growth and increased personal incomes are important as a means of expanding the freedom enjoyed by the members of society, but the freedoms depend also on other factors such as social and economic arrangements (for example, services education and health) and civil rights (e.g., freedom to participate in discussions and public inquiries) (Sen, 2000).

Although Sen's approach can be considered deliberately vague (Sen, 1992) and containing ambiguities and unclear boundaries (Gasper, 2007), it was recognized by the Nobel Committee and scholars for its contribution to the broader field of development studies and has spurred important debates at issues such as inequality, capital and savings, and the role of non-market institutions (Cambridge, 2002). Instead of providing a set of development tools directly applicable, the essential value of Sen's capability approach lies in its usefulness as a “way of thinking” (Robins, 2005).

In this aspect, aiming to investigate how local development can benefit from ICT, it is assumed that development is not limited to countries, considering communities and regions where people have limited access to resources, social services and education necessary to support them (Kamel, 2008). Hence the importance of thinking development in an integrated fashion, where basic demands are systemic in terms of simulating “capabilities”, and where the challenge to reduce socio-economical inequalities among cities and regions is huge.

This new prism of thought on development shapes up the dimension of interaction and articulation among social actors (productive units, public power, civilian society) under a more cooperative action logic, in counterpoint with individualistic and competitive behaviors, highlighting the importance of building social networks. The basic idea is that a development process is deeply rooted in its immediate social context, in social relations and interactions among actors sharing resources, establishing reciprocal obligations built on trust.

3. THE CAPABILITIES APPROACH

The capabilities approach (CA) has been developed and refined over three decades after Tanner lecture in 1979, in a series of books and articles on multidisciplinary journals (e.g., Sen, 1980, 1989, 1993, 2000). The conceptual basis of this approach consists in Sen's critics focused on opulence approaches (focused on income and commodity command) or functional approaches (focused on happiness, fulfillment, desire), which are usually found in economies of traditional welfare (Sen, 1985). The conceptual roots of CA (Sen, 1993) focus on the evaluation of social change in terms of the enrichment of human life resulting from it. The focus given by Sen (1993) envisions life as a set of "activities and ways of being" which are

valuable. Thus, the assessment of quality of life takes the form of a review of these functionings and the ability to use them.

In Sen's (1999) terminology, "functionings" are things people value and can have, and a person's "capabilities" consists in alternative combinations of functionings whose realization is feasible for him/her. Thus, the focus of development becomes increasing a person's capability set, or their substantial freedoms to lead the life they value. The model proposed by Sen (1999) contemplates people's freedom of choice regarding the use of resources available to them, the conditionings of these choices and how these resources are put. Sen (1999) points that the mere availability of a resource does not necessarily imply an improvement in social well-being. It is essential to ensure people have access to the ways of life they value.

The capacity of a person to choose amongst functionings is determined by conversion factors, that are factors by which people recognize a given set of resources, see if they have access to them and evaluate their interest and perceptions, reducing the initial set to one that is compatible to their capacity. When a potential functioning is made available, one can be prevented to choose it by several reasons. That means that is necessary to take into account the individual and structural variations in development evaluation analysis. (Zheng and Walsham, 2008).

However, CA has been regarded primarily as a framework of thought or a way of thinking about policy issues (Robeyns, 2005), and for this reason has been called by some an infeasible idea (Robeyns, 2006) and accused by others of not being sufficiently specified (Clark, 2006; Corbridge, 2002; Gasper, 2007). Nevertheless, there are those who consider CA very individualistic, not giving enough attention to groups and social structures (Corbridge, 2002; Devereux, 2001; Gore, 1997; Navarro, 2000), or even that it is difficult to find a balance between its conceptual richness and its potential to be operationalized in the research, development and practice (Kleine, 2010).

Despite criticism about the difficulty of operationalizing and individualism (Clark, 2006; Devereux, 2001; Navarro, 2000), it is argued that CA, being a normative and evaluative approach, provides a rich theoretical framework for assessing ICT4D and enables important issues surrounding the adoption of ICT for development. Viewing development as the expansion of the capacity of human beings to lead lives as they value (Sen, 2000), ICT should be seen as a means to achieve this objective in the development process. Treat conversion factors, which affect the well-being and freedom of individuals to agency, is as important as ensuring the availability of technology (Zheng, 2009).

3.1 Operationalization of the Capabilities Approach

In studies of SI, there has been a slow uptake of CA as a theoretical basis at ICT4D, but presented a growing tendency in recent years. Madon (2004) provides a good example of the application of CA at ICT4D. The author adopts CA to go beyond the traditional criteria for evaluating e-governance initiatives in India. Instead of measuring only expenditure, infrastructure, access and skills, she argues that we should also look at what people can and can not do with ICT applications offered and how effectively people benefit from them. Thapa et al., (2012), in response to criticism of individualism of Sen, explored how ICT initiatives help to create or improve the social capital of communities, which in turn can lead to development by building capacity and collective action. To illustrate, a case study was conducted in a remote region of Nepal (Thapa et al., 2012).

One attempt to operationalize Sen's ideas is offered by Alsop and Heinsohn (2005). According to the framework proposed by the authors, the ability to make an effective choice is mainly influenced by two sets of factors: agency and structure. Working together, these factors give rise to different degrees of empowerment, which – in its turn – is related to

developmental outcomes. The model is the result of an empirical research in five countries, where it was used to assess the impact of empowerment and identify causal relationships in interventions financed by the World Bank. Another important framework that can be connected to CA is the “Sustainable Livelihood Framework” (SLF), used by the UK Department for International Development (DFID, 1999, p. 1). The model was developed to help understand and analyze the living conditions of the poor and also to evaluate the effectiveness of existing efforts to reduce poverty. The SLF provides a comprehensive and systemic view of development processes, but its feature set is limited. Development objectives are treated as a compromise between the choices of the individual and the parameters set by the funder (Kleine, 2010). The SLF provides a detailed framework, but does not focus on choice with the same degree of detail. Hatakka and De' (2011) focused on the difference between potential and achievement of functionings and the importance of context and based upon the writings of Sen and operationalization of researchers from outside and within the field of ICT4D to develop their study.

Kleine (2010) introduced a framework as a form of operational approach for Sen's Capabilities (1985; 1992; 1999), visualizing elements of a systemic conceptualization in a process of development. Choice Framework was inspired by the work of Alsop and Heinsohn (2005), making a operational model for Sen's capabilities approach, taking elements from the sustainable life framework (DFID, 1999) to expand it. The Choice Framework (Figure 1) is a form of conceptualizing individuals' choices.

Although the underlying intent is to specifically assess the contribution of ICT4D, the structure itself can be seen as applicable to development processes in a more general way. This framework differs from the work of previous authors (e.g., Hatakka and De', 2011; Mansell, 2002; Gigler, 2004; Johnstone, 2007; Zheng, 2007; Oosterlaken, 2008) that have sought, from different angles, to show how ICT can be connected to CA. It cares about what is meant by development and mainly focuses on individual choices. The approach draws primarily the concepts covered by Alsop and Heinsohn (2005), the relationship among resources (assets), agency, structure and choice, but in an enlarged and more detailed way.

3.2 The Choice Framework

The Choice Framework (Figure 1) is an attempt to operationalize the CA in a holistic and systemic way, keeping much of its particularly useful conceptual richness in the area of ICT4D (Kleine, 2010). It was used in an analysis of the effect of ICT policies in local livelihoods in rural Chile (Kleine, 2007) and can be used in process analysis, as well as for planning and evaluation of development activities (Kleine, 2010). The focus lays on developmental results, being the preliminary result of development the choice itself. Secondary results depend on individuals' choices, such as facilitating communication among people, increasing knowledge or local income. Development projects should start from these wishes for results, measure how far they were reached and how results can/should take place.

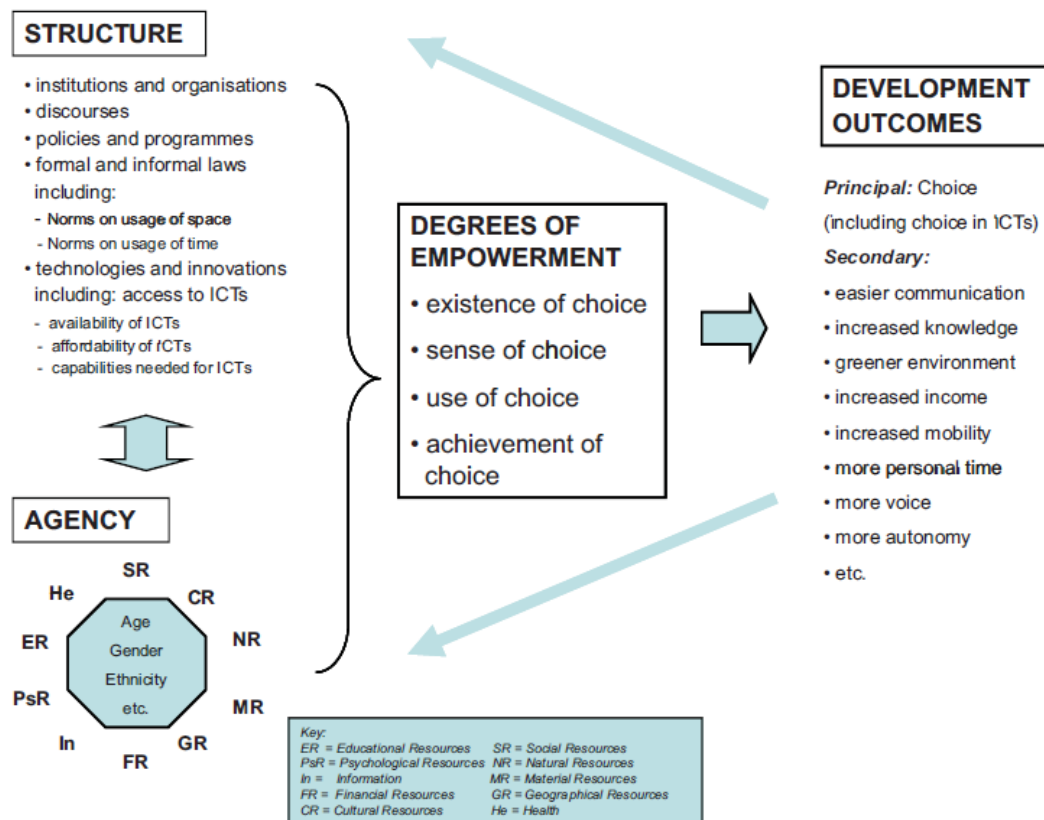


Figure 1 – Choice Framework
Source: (Kleine, 2010)

The agency includes 10 tangible resources (social, cultural, educational, psychological, health, information, financial, natural, geographical and material resources) that place specific challenges for mediation, but need to be taken into account. ICT can affect resources such as social resources (cheaper communication), geographical resources (proximity of access to installations), cultural resources (space to share knowledge), and material resources (hardware and software). Factors such as gender, age, ethnic group, etc. can influence access to ICT, but it can sometimes become less relevant or invisible in certain contexts. The structure includes rules, laws, formal and informal norms and policies that can influence an agency. By its turn, access to ICT can be divided in the dimensions of accessibility, availability and different necessary capacities for ICT access (Garter and Zimmermann, 2003).

The process described by the CF sees individuals as using their agency to navigate the structure to be in a position of choice. Following Kleine (2010) the choice is conceptualized as being multidimensional (degrees of empowerment): it has to exist (existence of choice), individuals have to be aware of it (sense of choice), they have to exercise it (use of choice) and then it may or not be effective (achievement of choice). The existence of choice and sense of choice is a way to interpret the Sen's capabilities, while outcomes can be seen as achieved functionings.

In general, the Choice Framework is an attempt to operationalize the Sen's Capability of the holistic and systemic view, maintaining much of its conceptual wealth, particularly useful in ITC for development. It's indicated not only as process analysis, but also for planning and evaluation of development activities (Kleine, 2010), including being as extension of two frameworks (Alsop and Heinsohn, 2005; DFID, 1999).

Finally, the Choice Framework draws attention to the important roles that innovation and ICT have in shaping social structure. Some technologies, such as Internet, mobile phone or, more recently, social networking has shown powerful influences on social, economic, politic and cultural spheres (Kleine et al., 2012). So, the framework allows to see the complexity of interventions in systems while placing the choice at the center of process analysis. Therefore, the selection of Choice framework is considered as adequate for this research.

4. METHODOLOGICAL ASPECTS

This research uses an interpretative case study (Walsham, 1995) to understand how an institution's use of ICT can contribute for the development of a locality. Sudotec was chosen for being a singular case. Placed in Dois Vizinhos, a small city in the southwest of Paraná state, Brazil, this association is considered exemplar in the state and exports its programs to bigger cities in that region.

The case study was conducted by means of semi-structured interviews with strategic people for the understanding of the analyzed questions. Six interviews were performed in July 2012, with the manager, superintendent of the institution and users of the offered programs. Secondary data were collected, such as documents, advertisement leaflets, activity reports and reports on certificates given to students to complement the information collected.

The data collected in the interview were recorded and later transcribed, codified and analyzed. The transcriptions were read to make a first description and to identify fragments regarding the effects of ICT found in literature. The analysis of content was performed with the help of ATLAS.ti® software. The transcriptions of the interviews and the documents found during the stay in the institution were sent to the software. Concepts were mobilized, so as to give meaning and interpret the constitutive role of the data. Based on development as freedom approach, other concepts were applied, as suggested by Choice Framework, in the attempt to identify the development outcomes, structure, agency and degrees of empowerment, forming webs and connections. Regarding the validity of the construct, multiple sources of evidences were used to create initial categories based on literature. As to reliability, the protocol and database were used.

5. PRESENTING AND DISCUSSING RESULTS

The results are presented for the case. For case, the context of the organization is presented first, followed by an analysis of the constructs of Choice Framework (development outcomes, structure, agency and degree of empowerment).

5.1 Study Object: Dois Vizinhos and Sudotec

Brazil was categorized as the sixth largest economy in the world (IMF, 2012), but when it comes to ICT, it is below the average of other western countries, regarding both ownership of equipment and Internet access at households, and citizens using them. The Survey on the use of Information and Communication Technologies - ICT Households and Enterprises 2011 (CGI.br, 2012) revealed that 45% of Brazilian population has access to computers and about four in every ten Brazilian homes (38%) possess Internet access. Regionally, the penetration of Internet in Brazilian households is the greatest in the southeast of the country, where technology is present in practically half of the households (49%). The south of the country is in a similar situation, where 45% of households possess Internet access, as opposed to the northeast, where the Internet is in less than one quarter of households (21%).

Paraná state is one of the 26 states in Brazil. It is placed in the southern region of the country. Brazil itself is officially divided in five regions: North, Northeast, Midwest, Southeast and South. Paraná ranks the fifth in the country in economic importance. It is one of the states with the greatest number of computer software producers and developers, the 5th

Brazilian state in number of companies connected with software activities, and the 10th in terms of IT formal employees (Ipardes, 2006).

With a population of approximately 36,000 inhabitants and a territorial extension of 418 km² (Ibge, 2010), Dois Vizinhos is economically highlighted in agribusiness sectors, with emphasis in swine, ranking third place in collection among 39 cities of the southwestern region of the state. However, from the 1990s, companies developing computer software started to establish themselves in the region. In the 2000s, the scenario has benefited of the approval of a fiscal incentive law for electronic and information technologies, with new opportunities for the economy of the city. At that time, movements towards to create a Cluster TI started in the region, formally instituted in 2003. Facing this scenario and concerns with possible instabilities of agribusiness, local business people had the initiative of uniting with the city power and academics to create a technological center focusing on this growing field. Thus, in 2003, the idea was presented and in 2004, Sudotec was legally constituted.

Sudotec aims to be a transformation agent in technological development for southwestern Paraná. It acts promoting courses of professional enabling and development, digital inclusion and support for new businesses in information technology. Its goals are to promote incentives to technology through qualification of young people, diffusion of entrepreneurial culture and increase knowledge level of the professionals. So, it allows increase income and reduction of the qualified professional deficit in the technology sector of the region. These are the main Sudotec's projects:

- Learn to Grow: aims to promote the professional capacity in the areas of business management and programming, so as to provide better professional qualification for people getting their first jobs and/or low income people;
- Digital Inclusion: aims to allow the population access to technological resources, giving them skills in computational techniques, both including them in the digital world and improving their professional qualifications and education;
- PeopleWare: consists in promoting and organizing courses, mini-courses, lectures and discussions, in knowledge areas mapped by IEEE Computer Society Courses;
- Software Incubator – ITS: stimulates the creation of development in technology base companies, offering physical space, business enabling and consulting for limited time;
- Sucatec: works with electronic waste recycling, by means of meta-art and meta-recycling, providing preservation of the environment and sustainable development.

Excepting PeopleWare, the programs are offered for free to the communities they help. Sudotec also promotes complementary programs such as: 1) national and international travels to fairs, congresses and conventions – four international and several national “caravans” have been performed. 2) Technical missions for the exchange of experiences with projects in other regions. 3) Graduate courses in software engineering, in partnership with Univel (Educational Union of the city of Cascavel), a course not offered by local educational institutions. Approximately 2,000 students have benefited from the programs Sudotec.

5.2 Results, Analysis and Discussion

It is possible to spot that the installation of Sudotec brought about changes in the regions, intervening in local development. The best assessment of facts revealed that, as the community was inserted in the universe of technology, it became aware of how ICT can bring benefits to the city. Learning about computing raised local productivity, improvements such as training of entrepreneurs for use IT to control stocks and sales, before manually, that later, they could be broaden the business using e-Commerce, with acquired knowledge in a course offered by the institution.

The constructs of Choice Framework (development outcomes, structure, agency and degree of empowerment) – presented in Figure 1 – were analyzed individually and are presented as follows.

Development outcomes

In the context of research on ICT, the results may be measured by what people value in their life (Kleine, 2010). The main result was the possibility given to the population to choose to connect and use ICT for their own benefit, in this use enjoying programs made available, often by Sudotec. Secondary results depend on individual choices, translated in this case as the possibility of learning new technologies, to include up in the workforce, to communicate virtually with others, to improve income in local commerce, either to contact with other cultures or by traveling.

Sen's (1999) approach, with individual's choice as primary result, however, suggests that the analysis should start from the bottom upwards, asking people how they live, what they value, and the results to want to see. For one of the interviewees, two of the biggest impacts of Sudotec were: giving young people the possibility of choice for conduct their careers; and allow that people using the Internet to communicate with distant ones. For another, it was the cultural change, prior facing agribusiness and now, technology. In fact, some may question if this is a valid "development result" or "impact" for a project, according to CA, expressed by means of Choice Framework, it is a result of development.

Agency

Sudotec offers programs that benefit the whole community, as well as provide installations, hardware, software and network infrastructure (material resources), besides free or low-cost programs, payment for the instructors (financial resources) that provide the community the opportunity to access information and improve qualify of live for those that choose to take part of the program. Furthermore, the access provided can broaden knowledge (educational resources) and it's motivational factor of participation (psychological resources). However, the contacts with peers, relatives and teachers (social resources) are also used to obtain information on courses and availability of vacancies, representing a form of interaction among members of the community (social resources). Interaction and contact with people from other cities and countries (social resources) can also be provided with the "caravans" and technical missions (cultural resources) in which people can leave their city (geographical resources) to travel and participate of congresses, international fairs and other events. The availability of such resources allows the community to understand their choices and find what they value, reaching results of the chosen development. Students' testimonials indicate the enrollment in one of the programs not only improved their level of education, but also provided them with other abilities and resources, such as confidence to speak in public and express their opinions, improving with relations with relatives and friends.

Structure

Agency is formed by the structure in which it operates. Since rules, laws, norms (formal and informal) and policies are included as part of structure elements (Kleine, 2010). Certain recent policies implemented by the federal government of Brazil, such as the National Broadband Plan and the creation of informatics labs in the ambit of the National Program of Educational Technology (Proinfo), tend to contribute for the effective digital inclusion of the part of Brazilian population that still lacked Internet access. In Paraná, the Law for fiscal incentive to electronic and telecommunications industry favors the Southwest Paraná. There is also, in that region, a Cluster of Software, with certain companies that are placed in Dois Vizinhos, favoring the actions by Sudotec.

In addition to the favorable context, Sudotec possesses a physical structure capable of accommodating the necessary installations to offer programs, kept in a monthly repay by City Hall and partner companies. Sudotec policies were based on international experiences of success, known in a technical mission made by the president and directors of local entities in Europe. Its main purposes: the improvement and scientific progress of the sectors of production and services; the experimentation, non-profit, of new socio-educational models and alternative systems of production, commerce, jobs and credit; the free promotion of education; the performing symposiums, conferences, congresses and seminars regarding the institution's aims; the defense and preservation of the environment and promoting sustainable development; and the promoting integration of public agencies and private entities. Formal rules are stipulated according to the profile of each program. As for funding, Sudotec is maintained by monthly transfers made by the city and by partner companies.

Degrees of empowerment

In Choice Framework, the agency of an individual can operate inside a given structure to reach several degrees of enabling, such as the existence of choice, sense of choice, use of choice and achievement choice (Kleine, 2010). In this case, both "ICT use" and "no ICT use" are existing choice options. However, Sudotec possesses adequate resources and is inserted in a structural context that gives individuals the option to choose, to use their resources for their own benefit, thus reaching the expected individual results.

6. FINAL CONSIDERATIONS

Pursuing the objective to discuss how the use of ICT can collaborate for effective local development, we sought to found, in-field, evidences that would help explore this matter. The results revealed positive effects of the use of ICT in social, economical and cultural spheres, as more than 2000 students benefited, more than 200 young people entered the labor market by means of programs, providing increased incomes, higher qualification and other; expand the project to other cities because of its positives results, incubation of new businesses, etc.

The analysis by means of Choice Framework allowed to identify those who opted to use ICT for their own benefit, participating in programs offered by Sudotec (primary result of choice) obtained benefits as the insertion in the work market, better participation in school, knowledge in different cultures, digital inclusion, facility of access to information and learning (secondary results). Considering that agency contemplates the conditions that allow people to conduct their lives and is dependent on the individual resources (Kleine, 2010), such features were present in the case, as self-confidence, learning, social integration, physical availability and motivation in addition to the skills needed to use ICT, and for those who did not have them, they were taught. Those who chose to use ICT can also take advantage of digital inclusion, ease of access to information and learning (secondary outcomes). Be literate, for example, has become more attractive with the entry of ICT in school, the mix between traditional activities with the use of computer and internet causes some charm among students, facilitating learning. The result shows even a drop in truancy.

The structure and agency proved appropriate and favorable to support these choices. There is no way to overlook the presence of the software cluster in the region, which contributed to the emergence of ICT in the region. However, we found that initiative and unity between public and private were essential for effective change. The work done astutely cooperates with ICT to promote a solid development.

However, drew our attention the fact that there were no substantial evidences the ICT are not yet perceived as possibility to improve of democratic practice, facilitating communication between government and citizens. No evidence of ICT use were found to

seek, evaluate and use information for this purpose, or to have freedom of access to data transparency, which should be of great public interest.

This research highlights the fact that the effective use of ICT, the cities can count with a further impulse to development. However, only infrastructure is not sufficient to show positive results, it is necessary to have long-term planning and guidelines to be followed (Cunha and Miranda, 2013; Heeks, 2010). In this case, international experiences and the caravans held periodically contribute to the success of ICT practices in the region.

Given the great potential of ICT to give choices to individuals, Sen's approach and Choice Framework have proved appropriate and can contribute to future discussions on the use and role of ICT for development work in the practice of development. Our study indicates, as suggested by Kleine (2010), the importance of considering individual choices and work structure and agency to start ICT4D projects, and identify (measure) performance. Recognize the agency of people and mobilize it to harness the potential of ICTs should be regarded as part of the development (Zheng, 2009). Furthermore, the CA highlights the aspirations and needs of individuals and takes a critical look at the context in which this agency is inserted so that the structure should be contained in the analysis.

Nevertheless, there are limitations in this study regarding its pretense to state that the use of ICT alone can promote a more effective local development. The main limitation is the fact that it is the study of a single case, not counting with research and comparing with other social, economical or even geographical contexts.

Finally, we believe this paper shows that the research in the use of the implications of ICT for development can be enriched by multidisciplinary. The work that starts in this paper can be amplified. Other actors (political actors and entrepreneurs, for instance) can become part of the study to deepen the results of individuals' choices, as well as studying more deeply the actions of government on development. Quantitative research can also be used to raise indicators and test hypotheses. It will be interesting to gather experiences with the application of Choice Framework in other cultural and socio-economical contexts and compare them with the study initiated here.

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