Association for Information Systems
AIS Electronic Library (AISeL)

Research Papers   ECIS 2016 Proceedings

Summer 6-15-2016

A CAPABILITIES APPROACH TO INNOVATION: A CASE STUDY OF A TECHNOLOGY AND INNOVATION HUB IN ZAMBIA

Andrea Jimenez
Royal Holloway University of London, andrea.jimenezcisneros.2011@live.rhul.ac.uk

Follow this and additional works at: http://aisel.aisnet.org/ecis2016_rp

A CAPABILITIES APPROACH TO INNOVATION: A CASE STUDY OF A TECHNOLOGY AND INNOVATION HUB IN ZAMBIA

Jimenez, Andrea, Royal Holloway University of London, UK, Andrea.JimenezCisneros.2011@live.rhul.ac.uk

Zheng, Yingqin, Royal Holloway University of London, UK, Yingqin.Zheng@rhul.ac.uk

Abstract:

This paper critically examines the linear claim, often made, that innovation leads to development. The orthodox view embedded in this claim, which equates development with industrial development and economic growth, is problematized in this paper partly by counter posing this orthodox concept of economic growth with Amartya Sen and Martha Nussbaum's heterodox conceptualisation of human development, which advances a comprehensive view of development that requires evaluation not only of income and wealth, but also of other aspects of well-being and agency that people have reason to value. This research uses interpretive research methods including semi-structured interviews and participant observation to gain insight into technology and innovation hub dynamics. Findings include that those working at tech hubs value belonging to a community of shared interest and contributing to social enterprises. We argue that tech hubs, as collaborative spaces, may contribute to human-centred development processes in ways not directly leading to employment or market-based innovative products.

1   Introduction

A technology and innovation hub (sometimes referred to as a tech hub or ICT Hub) is a space where technologists, computer scientists, hackers, web developers and programmers congregate to network, share programmes and design to bring their ideas to fruition (Gathege & Moraa, 2013). Tech hubs, as known today, began approximately 6 years ago. In broad terms they represent a form of co-working office space that can offer a variety of services like community building, pre-incubation, incubation and acceleration.

Scholars have only recently started studying these emerging organisations and have broadly stated that these are circumscribed under a paradigm of open innovation and collaboration (Schmidt et al., 2015). Although scarce, existing work on these (i.e. Toivonen & Friederici, 2015) highlight the role these spaces have to foster an environment which is integral to creative and collaborative work, all aspects which then are supposed to enable innovation. These insights lead us to consider that a discussion on technology and innovation hubs necessarily involves a discussion on innovation.

Tech hubs in Africa have grown consistently over recent years, and now number around 100 or so. The discourse around tech hubs in Africa has been characterized by an optimistic and promising view. International organisations, venture capitalists and other relevant actors have placed a lot of attention into these tech hubs, promoting 'entrepreneurship' and 'innovation', encouraging people to set up their own start-ups and work towards their own development. For International Organisations, the effect of these tech hub phenomena will help grow successful businesses stimulating job creation and generating new sources of revenue (GSMA, 2014; Bloom & Faulkner, 2016).

This reflects the dominant discourse and pressure for global south countries to increase their innovation capacity, to the point of replicating organisational structures from developed countries and adopting standard international levels of innovation and technology (Kara & Pamukçu, 2011). The challenge of this is that imitating a model of innovation from one region to another may fail to grasp the locally-owned talents and conditions for innovation. Therefore the existing inequalities between the North and the South may be enhanced rather than reduced (George et al, 2012).

To resolve this, we need to look for an alternative approach to the relationship between innovation and development, one that goes beyond competitive advantage and economic growth. To do this, it is necessary to problematize the existing linear linkage that equates innovation to economic growth and consequently development. This approach follows Srinivas & Sutz (2008)'s argument in relation to technological accumulation in developing countries. The authors argue that innovation, as a term, should be unpacked further, because satisfying to model in economic terms does little to capture the varied types of actual innovation processes.

Following this argument, in this paper we propose an alternative pathway to understanding the role that innovation has in development. We argue that it is important to broaden the concept of development from that of generating employment, industrial development and economic growth to what Amartya Sen (Sen, 1999) calls "the expansion of substantive freedoms" for individuals to make a wide range of choices that allow them to lead a life they consider valuable (Chew et al, 2013). Our research question is when and how does tech hubs contribute to development? Development here is defined as "a process of expanding the real freedoms that people enjoy" Sen (1999, p. 3). The end goal of development should be conceptualised in terms of people's capabilities.

The paper is organised as follows. In section 2, we give a brief presentation of innovation literature and explain the linear linkage with economic growth at different levels of analysis. In section 3, we examine the concept of development and present the Capability Approach as an alternative view. Section 4 and 5 will present the case study and methodology and relate the data collected to the Capability approach as an evaluative framework. We then round it up and present implications of the results in policy development.

2   Literature review

The American economist Milton Friedman wrote an article in 1970 titled 'The Social Responsibility of Business is to Increase Its Profits'[1]. In this article, the later Nobel Laureate argued that a firm′s responsibility to the society must be limited to its profits. In the article, he mentions a quote from his book 'Capitalism and Freedom':

> "there is one and only one social responsibility of business–to use it resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud." (1962).

Following a similar logic, for many years scholars from different disciplines have invested efforts in studying innovation and finding ways in which it can be improved, enhanced, encouraged and diffused (Rogers, 1995;Srinivas & Sutz, 2008). In most of this work, there is substantial evidence to derive that

---

[1] http://www.colorado.edu/studentgroups/libertarians/issues/friedman-soc-resp-business.ht

studies show the benefits of innovation in making countries wealthier; in making firms more competitive, and markets more profitable. Innovation then, seems to foster growth, profits and success (Hyvvärinen, 1990). And even though many scholars have tried to understand what innovation really means and how can it be enhanced, there is very little focus in understanding what effect the innovation processes does have on those involved. Instead, the explicit linking of innovation to economic development as a process has been highlighted by many (Mccormick, 2011; Gitau et al, 2010; Kesidou & Romijn, 2008; Sabir & Sabir, 2010).

From its conceptual origins, innovation has mainly been seen in terms of novel objects, processes and technologies and is evaluated in terms of economic success. This area of research goes back to Schumpeter's (1934) seminal work on economic development. Due to these origins, innovation has been framed mainly in its potential for positive economic outcomes (OECD, 2012). Existing literature on innovation has been mostly observed as a catalyst of economic growth and consequently development (Mccormick, 2011; Gitau et al, 2010; Kesidou & Romijn, 2008; Williams & Woodson, 2012). Examples of this are vast and include studies focused on the role of innovation for economic growth (Jaffe & Trajtenberg, 2005; Carlsson et al, 2008; Kesidou & Romijn, 2008; Williams & Woodson, 2012; Audretsch, 2006); and the role of entrepreneurship and innovation as a major enhancer of a country's competitiveness (Acs & Amoros, 2008).

The linear linkage between innovation and economic growth has limited our understanding of the relation between innovation and development. This is evident in the dominant discourse of innovation, which has led to the belief that the dichotomy between developed and developing countries is also one of innovating and non-innovating economies (Kara & Pamukçu, 2011). Scholars from applied economics literature recommend the 'non-innovating' countries to strengthen the use of their resources, in the hope that one day these will reach the threshold necessary for innovation and growth (Aristizabal-Ramirez et al, 2015). But given that innovation is dependent on physical and human capital, countries that present low levels of these elements may fit into the 'no-growth' category. Two things are enhanced from this view: the role of innovation contributing to economic growth and development; and the fact that some countries have the capacity to innovate and some do not, reinforcing the inequalities between the North and the South.

It is evident in the different literatures that, depending on the dominant paradigm and discipline, definitions of innovation vary, with each focusing on a different aspect of the term (Smith-Doerr et al, 2004; Everett, 1995; Damanpour & Schneider, 2008). We present three types of literature to develop this idea further: from management and organisation studies, National Innovation Systems literature (Freeman, 2002; Nelson, 1963; Chaminade et al, 2010) and the Diffusion of Innovation (DoI) and Technology Acceptance Model (TAM).

In organisational studies and management literature, a closer look at the end goal of most studies leaves us with interesting insights. Management scholars, for instance, have considered the role of innovation as a critical source of competitive advantage (Dess & Picken, 2000; Heunks, 1998; Tushman & O'Reilly, 1996) and the role of process innovation in firm productivity growth (Rochina-Barrachina et al, 2010). Likewise, innovation capability has been extensively studied as one of the most important determinants of a firm's performance (Mone et al, 1998). Process innovation is understood in terms of its potential to "[…] improve production and management processes" (Wang & Ahmed, 2004, p.305).

Another stream of literature focused on the concept of National innovation systems. This stream provides a better understanding that innovation should be context-sensitive. For instance, focusing on National Innovation Systems in Latin America, Arocena & Sutz (2000) explain that the concept should be applied with 'a southern perspective'. Innovation from the South "(…) *can be envisaged as a research programme, strongly connected with the rethinking of development problems in the age of globalization, having as a research agenda a 'broad spectrum' of general and specific questions, and with a research methodology of its own to be able to tackle such an agenda.*" (p. 56).

Furthermore, both the Diffusion of Innovation (Rogers 1995) and the Technology Acceptance model (Davis 1989) have been widely used in information systems research and consequently constitute the

dominant theories in studies looking at the role of ICTs for development (ICT4D) in the last two decades (Annika & Hatakka, 2013; Zheng, 2015). This body of literature is mainly concerned with the adoption and diffusion of innovations, rather than the emergence of innovations, and has been previously criticised for taking for granted all the different aspects of context and structure that shape the innovation, sometimes considering people as passive social groups that exist independent of the object (Akrich et al., 2002; Rye, 2009). Zheng (2015) observes that this genre of research does not pay adequate attention to issues of power, politics and culture, which affect users' interaction with innovation, or the embedded values in the design of innovations. Behind the simplistic and fixed view of these theories is an underlying assumption that innovation automatically represents progress, without considering who is innovating, for whom and what, and under what circumstances. Information systems research generally shares the view that ICT innovation should be pursued mainly to foster economic growth and to enhance productivity, with very little discussion on what kind of growth is more inclusive and holistic (Xiao et al., 2013).

More recent emerging literature has been focusing on how innovation can serve the disadvantaged. This stream has developed a number of concepts that highlight the importance of innovation at the grassroots level ('grassroots innovation); innovation at the Bottom of the Pyramid (BoP) (Immelt et al, 2009; Hart and Christensen, 2002); frugal innovation (Zeschky et al, 2011; Bhatti, 2012); and inclusive innovation (Altenburg & Lundvall, 2009; George et al, 2012; Heeks et al, 2013). These concepts step away from the mainstream literature in that they look at other aspects of innovation and highlight the importance of contextualising innovation. For instance, Ramani & Mukherjee (2013) conduct case study research on technological innovations and looked beyond making the price-performance ratio attractive and accessible to BoP consumers. It also focused on the positive externalities for the environment and improvement of health by the individuals involved.

These concepts are more inclusive by definition, and are able to demonstrate that even in most deprived environments innovation can be found, and organisations that wish to deploy innovations should overcome existing biases about the poor (London, 2008). However, they do not explicitly state what sort of development they are looking at. There is not sufficient attention paid to the aspects of an innovation process and their relevance in development. Instead, focus is more on the processes in which products originally created for the poor environment are successfully upgraded to the developed world.

Evidently, not all scholars are explicitly establishing the linkage between innovation and economic growth. A vast amount of literature has focused on other aspects that enhance or diminish innovation. For instance, some studies look at knowledge creation and innovation as a result of new combinations of knowledge and other resources (Yli-Renko et al, 2001; Cohen & Levinthal, 1990; Inkpen & Tsang, 2005). Other scholars have asserted that social capital plays a key role on an innovation process because it promotes risk-taking due to the feature of ties and social relations (Camps & Marques, 2013). Following a very similar line various scholars study the effects of networks in innovation.

All of these are very useful to explain what enables and what affects innovation processes, but they are not sufficient to help explain what effect innovation has in development. In the majority of cases, these approaches to innovation have implicitly rested on the assumption of the commercial and competitive possibilities that innovation has for economic growth (Srinivas & Sutz, 2008). This is the key point that we are trying to examine, by presenting what we understand as development, and why economic growth should not be the only objective when looking at processes of change in societies.

3.   Human Development and Capability Approach

For several decades, the mainstream notion has been to equate development with financial income (Willis, 2005). From this view, a country's development was evaluated from its GDP. This was then challenged by practitioners and scholars who argued that to adequately assess progress we need a more multi-dimensional conception of development (Chambers, 1994, 2004; Haq, 1999). This origi-

nated in the Human Development approach, specifically founded on Amartya Sen's Capability Approach (Sen, 1999, 2002).

 The Capability Approach has become in the past years one of the most adopted development theories, both as a critical perspective and an evaluative framework with a specific definition of development as substantive freedom (Zheng, 2007). The concept of freedom is used in a broad sense to refer to the effective opportunities an individual has, and its capabilities to effectively lead a life that he or she has reason to value (Sen, 1999). More explicitly, Sen's definition of development is "a process of expanding the real freedoms that people enjoy" as well as "the removal of major sources of unfreedom: poverty as well as tyranny, poor economic opportunities as well as systematic deprivation, neglect of public facilities as well as intolerance or over activity of repressive states" (Sen, 1999, p. 3).

From this perspective, development should be focused on what people consider as a "valuable life" for them. This is not to say that in evaluating development we should not assess income or the meeting of basic needs. Sen argues that in order to adequately evaluate development, a wider informational basis is necessary to allow us to assess other things that people value such as the "ability to reason, appraise, choose, participate and act". Furthermore, Sen argues that instead of asking about people's satisfactions and resources accessible to them, we should focus on what people can actually be able to do or be (Nussbaum, 2001). This is presented in the literature as the capabilities of an individual.

The Capability Approach has been deliberately left 'incomplete' because Sen has intended it to be applied for multiple purposes (Nussbaum & Sen, 1993). Because of this it has been considered by some as difficult to operationalise (Robeyns, 2006), and it has often been criticised for being insufficiently specific (Corbridge, 2002; Clark, 2005). In this regard, Nussbaum (2001) has complemented the Approach by presenting a list of central human functional capabilities, which can be universally applied.

This review presents an alternative approach that attempts to open the scope of the innovation process literature, and observe it from broader and more inclusive dimensions. In short, it takes a more holistic view of innovation and its impact. To do this it will apply the Capabilities Approach as a philosophical foundation from which to evaluate the different aspects in an innovation process. Following other scholars, this research constitutes a more humanistic human-centred study on innovation, combining a philosophical principle with concepts from organisational literature (Rocha & Miles, 2009).

In the next section we will present a study conducted in a tech hub in Zambia. We aim to understand more about the work being done in the hub and the impact it has on member's work and life in general. Instead of examining the potential contribution of the tech hub to employment and economic development, we seek to understand to what extent the innovation processes in which members are working in help to expand their capability set.

4.   A Technology and Innovation hub

4.1   Research methodology

The objective of this paper is to explore an alternative approach to innovation and development by looking at a technology and innovation hub in Zambia. An ethnographically informed approach was developed by immersion in the research setting for over 3 months. Data collection methods included semi-structured interviews and participant observation (Atkinson & Hammersley, 1994; Bryman, 2004;Yin, 2004). 35 Interviews were conducted and lasted an average of 40-60 minutes. These were done in situ to members of the hub as well as the managers during their time at the hub, seeking to have a better understanding of the organisation's own framing and self-description, as well as the underlying assumptions, goals, and practices of various actors.

Participant observation was used to cross-reference, provide some triangulation and to understand the context and observe people's behaviour within the space. A research diary was kept to clarify the topics and identify new ones. This allowed the researcher to see what people perceived and said about the

space and its impact, and also observe interactions and dynamics within the space that allowed the construction of a more complete analysis.

Interviews were transcribed verbatim and examined using qualitative data analysis methods (Miles, 1994). Transcripts were read several times and notes were taken on key/constant topics. Using the capabilities approach as a sensitising device (Giddens, 1989; Walsham, 2001), the data was organised and coded in Nvivo, focusing on what people value in relation to what they do in the hub. Themes arose from the interviews were further explored in the literature (e.g. "community", "collaboration" and "creative thinking"), thereby allowing for an iterative process to deepen the analysis and generating further insights from the data.

4.2   Case Study: Tech Hub in Lusaka

The tech hub was founded in 2011 as part of a project that consisted of fixing old computers to deliver to colleges in Lusaka. The project recruited young technologists to work as interns, and even though the young interns had received previous training in software and hardware development, their skills were relatively basic. This led to the creation of a space in which young people interested in technology could gather to learn more about IT and implement what they had learned in the past, providing them with the opportunity to develop their skills. Four years later, the tech hub has approximately 300 members registered on their mailing list and approximately 30-40 members using the physical workspace.

The majority of members are young Zambians aged between 16-35 years old. Some of them have received training on web development before or have studied (or are studying) computer science or computer engineering in college. Most of them however, have not had a previous work experience. They have not necessarily received a college education and some tend to arrive to the hub to learn skills, such as computer programming or acquire knowledge on how to set up a business. The majority of them are men, with a very small number of women (from approximately10 people, 3 were women).

The hub is free of charge and open on a daily bases. The 'hybrid format' of the hub as an organisation allows members to have the option to visit the space in a format they choose. Members can visit the space on a daily bases or every fortnight. They can focus on their own work or on group projects, network with others and in some cases make use of the space to play video games. They can initiate projects freely, which in some cases lead to an application, a business idea or a learning experience.

We identified three main profiles of hub members: the *tech enthusiasts*, the *tech experts* and the *entrepreneur-oriented* ones. The first group visit the hub every fortnight to learn coding languages or other things related to tech. These enthusiasts tend to be relatively new to the hub, and those who stay for longer tend to become tech experts/mentors. In the majority of cases these enthusiasts visit the hub purely for interest, not because they want to obtain something more tangible out of the hub like a job or a degree.

The tech experts, who already have a certain level of knowledge on technology and want to apply it to create positive change in their community, have studied computer science or some sort of tech-related subject. They have been part of the hub community for longer than the tech-enthusiasts and have learned several coding languages as well as software for web design. These young experts are creating mobile applications and websites, and in some cases are mentoring others in their own work. The majority of the innovations they were developing had a strong social focus (e.g. a mobile application of the Zambian Constitution; a language application that translates from English to local languages; a Women's Rights application). In other cases they organised communities of interest (e.g. people interested in robotics; people interested in developing game applications; for people interested in learning Java code and use it to create websites for NGOs). The majority of the products created at the hub were ICT-based (i.e. mobile applications and websites), though in some cases they were experimenting with robotics (i.e. Raspberry Pi). Most of these were created within the hub from scratch, and in some cases they led to the creation of a start-up or a community of interest.

The entrepreneur-oriented group is characterised by members with a strong interest in implementing and turning an idea into a business. This group was the smallest in number. These members were not specifically working on a tech-based product or idea, but were more interested in working on a project or a business. There were different stages of these identified, as there were people who only had an idea and were testing it, and there were also those who had created a small start-up and were developing it from the hub premises, and those who had a more established business and were getting revenue from it and were using the hub as a co-working space. For these, the hub also provides with incubation and mentoring services. They have also benefited from collaborating with the tech experts within the hub, who have helped them design their website or mobile application for their business.

The following subsections present four aspects of innovation-related activities taking place in the tech hub: promoting creative thinking; enabling collaboration and learning; developing a sense of community and building identities.

4.2.1   Promoting Creative thinking

Creativity is presented by the experts (Amabile, 1998) as an individual phenomenon consisting of three main components: Expertise, motivation and creative thinking skills. The latter of these three is presented as *"how people approach problems and solutions their capacity to put existing ideas together in new combinations."* (p. 79).

Following this idea with the notion of capabilities being a space of opportunities and choices for people to do or be, the analysis of the data shows that there were some dynamics within the hub that promoted creative thinking between the members. This in consequence enhanced the member's ability to *be* creative and *act* creatively, an important capability for innovation. During the fieldwork, it was observed that members were encouraged by the hub managers to observe, experiment, implement, research and discuss. More specifically:

Action	Description	Intensity
Observe	-What other members of the hub were doing and how they were doing it	Medium
Experiment	-With different coding languages as well as software	Strong
	-With devices such as mobile phones, computers, and game applications	Medium
Implement	-Their ideas and develop prototypes and drafts of their designs	Strong
Research	-What people in other countries have been doing in relation to the same innovations they are working on	Weak
Discuss	-With peers about their projects and bounce ideas around.	Strong

Table 1: Creative thinking in the hub 1

Members were encouraged to practice these and they did at different levels. Overall, hub managers were keen in helping members to be creative and curious of the things they were learning. There was a strong sense that a good way of learning how to code or create a website was by working together and looking for ways to solve things collaboratively. Because resources were scarce or not everyone within the space had the answer to things, members undertook joint searches online to be able to find solutions. They looked on online forums and communities and then shared the learning within the people at the hub.

> *" […] even though we didn't have many tools to work with, we decided to teach ourselves how to do it and start up a community of people who make such projects."* (Dr).

Hub managers often made use of brainstorming sessions to work on ideas. This open and collaborative approach did not involve any conversations on intellectual property or copyright issues. Members did not show any concern that their ideas, by being shared in front of other members, would be stolen from them. When asked why this was the case, interviewees referred to trust as the main reason.

4.2.2 Enabling Collaboration and Learning

A strong sense of collaboration and trust was observed during the fieldwork. This form of collaboration increased members' capabilities in the form of doing ICT applications, as well as analysing and solving problems. Even though the hub provided incubation services, our interviews and observation led us to see that most of the learning processes happened between peers or in form of mentoring. This meant that in some cases members looked for the information online or they consulted the more experienced members. Because a lot of the work evolved around coding, one of the most mentioned problems was finding bugs in their codes. And so a very strong sense of collaboration was observed when members had to fix a code. This collaboration led, in some cases, to learning processes by the ones involved. This echoed with previous authors who explain how knowledge is tacitly distributed among people and mutual teaching and learning are fundamental for the solution (Duguid, 2005; Fischer, 2001).

As mentioned previously, most of the hub members had never had previous work experience and in some cases some had not had a university or college education. This implied that members lacked knowledge and skills relevant for their work at the hub. We observed that members, including the entrepreneur-oriented ones, lacked knowledge and skills in starting a business, skills on how to set up a business, or register a company in Zambia. It was also observed that they lacked information on legal aspects for investment and issues of copyright, registering a company, etc. This lack of knowledge and skills meant that the hub, more than providing a space for incubation of businesses at first hand, represented a learning space. Even for the more advanced entrepreneur-oriented ones, the hub was the first place where they learned the necessary skills to set up their business.

Members either exchanged information and resources or worked together to develop their projects. For example, an entrepreneur-oriented member would work together with a tech-enthusiast to develop a website for her business idea. In exchange, the tech-enthusiast would benefit from the learning process, as well as increase his set of work experience that improves his potential to get further work. When both members were asked about the process, they mentioned that this was beneficial for both, and it was possible because the hub is a space where people trusted each other.

In the literature, collaboration is seen as a process where people usually know each other, work together and have opportunities to give feedback to each other's ideas and work (Mamykina et al, 2002). As a pre-requisite, trust is presented as an important element that enhances the quality of collaborations, because it improves communication between the people collaborating. (Levin, Cross, and Abrams, 2004; Gausdal, 2012; Hardwick, Anderson, and Cruickshank, 2013).

Another form of collaboration observed was in the form of learning and problem-solving. Some members mentioned how before they were part of the hub they preferred to work by themselves, but learned the benefits of working with others by being part of it:

> *"[…] just for the sake of being able to bounce your ideas off somebody. Before I used to prefer to work alone because I felt like other people, they just can't keep up with the thought process, or is just frustrating because they could put bugs on the code. But then I learned that you learn so much from other people. Even though just the way they think, the way they write their coding. So definitely now I'm pro collaboration all the way."* (C)

In a similar line, another form of collaboration was visible in the form of mentoring, where text-experts would share their expertise and knowledge with tech-enthusiasts and provide feedback and help to them. A tech-enthusiast shared his experience:

> *"[…] So you find people around here could really help you like* [name of a tech expert] *has been of great help. If I ask him how do I go about with this because sometimes I am stuck so he comes and helps me. In a cafeteria I don't think I would meet such people. So it's really a good opportunity for me to have these guys around and just talk and they help you out."* (Je)

4.2.3 Developing a Sense of Community

The literature on capabilities has established a relevant distinction in relation to the idea of collectivities and whether groups of people are also important and should be studied to understand human capabilities (Ibrahim, 2006, 2013; Stewart, 2004). Scholars like Ibrahim (2008, 2013) argue that there is a collective capability on the basis that it is a capability produced in a collectivity. This 'collective' view of the Capability Approach is based on the assumption that formation of groups can either lead to conflict and undermine individual capabilities, or it can lead to an improvement in their conditions and capabilities (Stewart, 2004). And it is because of their influence on individual well-being that we need to think of collectives of people and the potential they have of enabling 'collective capabilities'. These are mainly obtained by being part of a specific collective or group of individuals. Groups are understood as 'ways of categorising people in ways that represent common affiliations or identities' (Stewart, 2004, p.2).

We adopt this understanding of collective capabilities to evaluate the sense of community that derived from our data. Being part of a collective led member to *be* entrepreneurial and collaborative in their work. Interviewees were asked about the motivations for their work and the impact the hub has had on them. The majority of the respondents said they liked being part of the community of the hub, because they felt it was a space for people with 'out of the box' thinking in their country:

> *"-I liked the environment, how people think, we are all like in the same mind set.*
>
> *I: what kind of mindset is that?*
>
> *- driven, I feel like we're driven."* (P)

The hub was a place where members found different kinds of people with a driven mind set. But also, it was repeated by respondents that the hub was a special place because it was difficult to find such a space in Zambia. And so this reflected the uniqueness of the organisation in their context:

> *"This innovation hub is pretty much the only one and people still do not understand what an innovation hub is because we don't have an innovation hub in Zambia. If you go to someone and ask them about an innovation hub they wouldn't know what it is so I will explain to people what [hub] is about what it does"* (G).

The uniqueness of the hub encouraged people to feel comfortable to open up and share their ideas and projects. The freedom to experiment and share their ideas was substantial for the creative process that members were immersing themselves in.

> *"The great thing about* [the hub] *when I first came here and even now is that if you want to try something you just do it. And if that doesn't work, well it didn't work, what do we learn from that?"* (M).

Respondents mentioned repeated times that what they valued the most of the hub was being part of the community. Hub managers mentioned that their strongest asset was the community that was built from the bottom-up and in an organic manner:

> *" Anytime you go to an event or something, everybody already knows the organisation and its reputation. And I think the most amazing thing is that... so back in the day a lot of people knew about* [the hub] *but they didn't know what they did. And it's pretty amazing to have such strong brand recognition when nobody knows what you do. I thought that was pretty compelling."* (K).

The type of community that has been formed at the hub is one based on a common identity and set of practices (e.g. Radcliffe, 1999). However, we also identified that this community had a strong focus on 'working together and solving problems'. Therefore, we partly adopt Fischer's definition of communities a composition of "[…] *individuals who have unique experiences, different interests and perspectives about problems and who use different knowledge systems in their work."* This conceptualisation allows us to understand that communities are not necessarily homogeneous in character and practices. The common shared trend of this definition is that these communities of interest engage in problem-

solving practices, something that was visible in the hub community. But we also see communities as a live experiences rather than static organisations, which are configured and reconfigured by its members and the context in which they are embedded.

The sense of community offered some support for members, who mentioned in the interviews that they felt significant challenges in their wider society, because it still did not recognise entrepreneurship or IT as a valuable profession. This was especially evident in women. As mentioned previously, the majority of hub members are young men, with a very small number of young women. This is proportional to the overall context of Zambia, characterised by a traditional society where gender roles pressurize women to become teachers or nurses and/or work for the government. Because of this, the number of women working in technology is very small in comparison to the number of men.

Despite this, the women who attended the hub had found in the organisation a place where they challenged their gender stereotypes and decided to pursue entrepreneurial careers or develop digital skills. The sense of community gave them the security and confidence they needed to embrace an entrepreneurial path or learn to code.

4.2.4   Building Identities

As mentioned previously, even though Sen left the Capability Approach open as a philosophical foundation, some scholars have tried to operationalise it. Among them, Nussbaum developed a list of universal capabilities to use as an evaluative framework. This list includes *"being able to work as a human being, exercising practical reason and entering into meaningful relationships of mutual recognition with other workers."* (p. 80). This resonated in our data when we looked at how member's identities were being formed and validated by working in the hub.

For example, some tech experts mentioned that they were able to find jobs outside the hub, but in most cases decided to stay and work on their own projects. Even those who found jobs were still linked to the hub, by attending networking events or by visiting the hub after working hours. When asked why they kept on returning they mentioned that it was because the hub had given them a sense of identity and direction, which they did not have before because of social structures that undermine their choices, namely their society and educational system. Some mentioned that the careers they have decided to work in are still not understood within their society, and so being part of the hub helped them overcome a sense of rejection from their social circle, which fails to consider a career in entrepreneurship or in technology as a productive one. This was more noticeable in the female members of the hub, who had to deal with even more social exclusion than the male counterparts:

> *"Science subjects is preserved for the men...there's many examples of how our educational system can segregate men and women. And just embedding this idea that girls   should   do something else. So it's not fair. And even in terms of career choice, of course women are   ex pected to take certain kinds of jobs, because other jobs are for men."*(K).

> *"[...]in Zambia, I don't think that women are considered less than men. I think is just our culture. In our culture, many women are raised to be wives. And if you're a wife in Zambia then is not that you're a servant to your husband but you have to serve the husband."* (KF).

The hub then represented a place where their work and career path was legitimised, as the hub itself had been established as a well-known organisation in Zambia. One of the oldest members of the hub mentioned in an interview:

> *"I would say it's really grown. From 2012 we've had a lot of people interested. If you go on the streets there's a high chance you will find someone who says 'yeah I know that place'. And we've had a lot of events. We've had a lot of recognition from locals and different sur rounding countries. I follow the tech news in South Africa and [the hub] the name is recog nised now."*(D).

Several respondents talked about how by being part of the hub they have been able to define their career path and overall future. When they finished school they had no idea what they were going to do,

as there were very few jobs in Zambia for them to apply to, and even those available required some experience, which they did not have at the time. Through such circumstances, they found the hub and started going to the space and engaging with the community. In doing so, they learned the necessary skills to be able to develop their own ICT applications. These assets opened more choices for members as they grappled with the challenges of having to deal with lack of employment and with the stigma of pursuing entrepreneurial careers in a traditional society. This means that because of the learning in the hub, they have had greater agency to improve their lives. This freedom to explore the intrinsic value of creativity is possible because members of the hub feel a strong sense of community.

In this sense, the hub had given them the choice to pursue a career they value, and it had allowed them to develop the necessary skills for it. It had also provided them with a community that strengthened a sense of belonging, which were significant to them due to the fact that their relatives and friends preferred more traditional careers and did not seem to understand how a career in entrepreneurship and ICT can lead to success. When asked about this, respondents mentioned that becoming rich and making a lot of money were not their priorities, but that what they wanted was to 'follow their passion'.

In reference of why they were working on a technology and innovation hub:

> *"I'm very passionate about Africa, and about Zambia. So I would want to know that whatever it is that I'm working on, at whichever point, should be something that is making somebody's life better."*(Cl)

In this respect, Zheng (2009) reminds us of the point of agency freedom, presented by Sen. This includes the capabilities to pursue one's own well-being but may also include the well-being and freedom of others, as well as collective goals of communities or a nation and *'respecting social and moral norms, or acting on personal commitments and the pursuit of a variety of values.'* (p. 71). This member of the hub was looking at the hub as the place where she could make a difference in her community. The hub thus enhanced the capability of members of the organisation to develop their digital skills, as well as pursue their passions and provided with a platform for them to contribute to their wider society. It has also broadened their options to become entrepreneurs, should they wish to. As derived from the Capability Approach, the capabilities available to an individual represent the person's effective freedom to live a valuable life (Robeyns, 2000). In this case the freedom to be an entrepreneur or the freedom to work in technology reveals that the available functioning for hub members has been expanded, and consequently their effective freedom to live a valuable life.

5.   Discussion

Amongst the list of human capabilities developed by Nussbaum's there is the one related to senses, imagination and thought, which resemble some of our analysis. This is described as:

> "[…] *Being able to use the senses, to imagine, think and reason – and to do these things in a 'truly human' way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing self‑expressive works and events of one's own choice, religious, literary, musical, and so forth. Being able to use one's mind in ways protected by guarantees of freedom of expression with respect to both political and artistic speech, and freedom of religious exercise. Being able to search for the ultimate meaning of life in one's own way. Being able to have pleasurable experiences, and to avoid non‑ necessary pain.*" (Nussbaum, 2001, 2003).

Our research has shown that when individuals immerse themselves in an innovation process, there are certain things that happen which enhance a number of capabilities and ultimately lead to human development. More specifically, when members of the hub decided to immerse and do novel things within their context, they were also getting involved in creative thinking, they developed a sense of community and formed their own identity. Moreover, they undertook collaborative practices, which facilitated these processes.

Figure 1 summarises the capabilities identified to have emerged from the innovation processes occurring in the tech hub.

The Capability Approach, as an evaluative framework, is rooted on the idea that the quality of human lives can and should be taken into account when assessing human progress (Wells, 2012). If innovation does in fact contribute to social progress, then it is reasonable to apply the Capability Approach as an evaluative framework that can help to conceptualise and evaluate these phenomena.

This research looked to understand alternative ways in which innovation can be applied without necessarily having to adopt a 'catch-up' paradigm. It did so by exploring more about perceptions of members within a technology and innovation hub in Zambia, and the impact the hub has had in their work and life. By doing this, we have been able to see that members of the tech hub are not limited to business-centric perspectives of innovation and entrepreneurship. Instead, social issues and a strong sense of community motivate them, and they apply these interests to innovate.

As mentioned previously, the innovation paradigm is mainly applied and founded in economic rationale.

The previously mentioned linear relation between innovation, economic growth and development would have led us to believe that the tech hub failed at innovating, and thus failed at development. Conversely, this approach has led us to see that the impact of enabling people to immerse in innovation processes is much broader. Instead, members' freedoms are expanded as a result of being part of the hub, as they are pursuing entrepreneurial careers they would not have been able to pursue otherwise. Furthermore, the hub constitutes a space where they have the choice to be part of a community of like-minded people, which is in itself valuable.
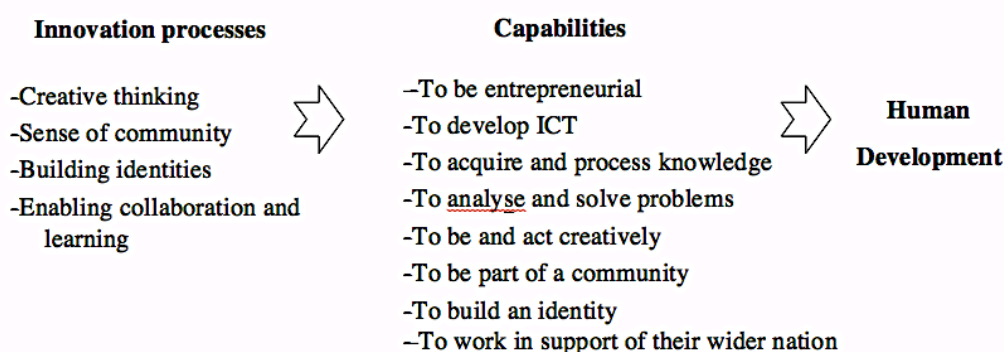

Figure 1: An alternative approach to understanding the relation between innovation and development, based on Amartya Sen's Capability Approach

The role of the hub had a particular impact on the female members of the hub. As Nussbaum (2003) argued: *'in a nation where women are traditionally discouraged from pursuing an education it will usually take more resources to produce female literacy than male literacy.'* (p. 35). In this case, women's capabilities were enhanced, as they were able to be entrepreneurial, acquire and develop knowledge in a context where their role should be different.

6. Concluding remarks

There is an evident interest from countries, international organisations and corporations in supporting businesses and innovations being developed within tech hubs. The reasoning behind this strong support is that encouraging innovation and entrepreneurship may lead to economic growth, job creation and overall progress. In the same way that the direct link between economic growth and innovation limits scholars to see other dimensions of an innovation process, policies supporting innovation and entrepreneurship purely from these lenses will fail to embrace the other aspects, sometimes more relevant for the individuals on the ground.

A technology and innovation hub's organisational structure is one of a hybrid format. These organisations fit the needs and provide services for their community. In most cases, the emphasis rests in creating a community of like-minded people, offering the necessary resources for them to work, learn, and potentially collaborate on projects. Not in all cases do they provide with incubation services or start-up development. Although these hubs serve as infrastructure to support the development of technology, entrepreneurship and innovation, not all are start-up factories, let alone producers of high-growth firms. In some cases these provide services that strengthen pre-capabilities for business development, support a community of passionate young entrepreneurs looking for like-minded people, and promote social inclusion of women and those lack formal training and education to pursue creative IT work otherwise not available to them.

Therefore, to focus on the business impact of these hubs is a limiting perspective. Introducing this approach into policy can be challenging. But a good starting point would be to recognise that the relevance of these hubs is not purely based on the quantity of its financial resources and output, but on their contribution to local communities. More research is needed to consider 'what is the end goal of innovation?' and 'what do people value by being involved in an innovation process?'

Even though this research gave us an interesting insight from members of the hub, a few points should be considered. A main finding is that a member's motivation to be part of the hub is not solely financial income, but to be part of a community of like-minded people and pursue an entrepreneurial path that the hub can facilitate. This 'freedom' of choice to live a life they value is very much linked to other kinds of freedom they have. What we derive from this is not to suggest that business development and growth are not important. Just as the Human Development states, the economic sector is important as means to live a valuable life. Instead, what we argue is that the relation between innovation and development cannot be seen in purely economic terms, and we need to broaden the discourse, as well as evaluative frameworks and policies in relation to grassroots innovative initiatives and platforms such as technology and innovation hubs.

3   ACKNOWLEDGEMENTS

REFERENCES

Acs, Z. J., & Amorós, J. E. (2008). Entrepreneurship and competitiveness dynamics in Latin America. *Small Business Economics, 31*(3), this issue. doi:10. 1007/ s11187-008-9133-y

Altenburg, T., & Lundvall, B. (2009). Building inclusive innovation systems in developing countries: challenges for IS research. Handbook of innovation systems and developing countries: Building domestic capabilities in a global setting, 33-56.

Amabile, T. (1998). How to Kill Creativity. *Harvard Business Review*, 77–87.

Annika, A. & Hatakka, M., (2013). What are we doing?-Theories Used in ICT4D Research. In *12th International Conference on Social Implications of Computers in Developing Countries*. pp. 282–300.

Akrich, M., Callon, M. & Latour, B., (2002). The Key to Success in Innovation. *International Journal of Innovation Management*, 6(2), pp.187–206.

Aristizabal-Ramirez, M., Canavire-Bacarreza, G., & Rios-Avila, F. (2015). Revisiting the effects of innovation on growth: a threshold analysis. *Applied Economics Letters*, 22(18), 1474–1479. doi:10.1080/13504851.2015.1039699

Arocena, R., & Sutz, J. (2000). Looking At National Systems of Innovation From the South. *Industry & Innovation*, 7(1), 55–75. doi:10.1080/713670247

Atkinson, P., & Hammersley, M. (1994). Ethnography and Participant Observation. *Handbook of Qualitative Research*, 1(23), 248–261. doi:10.4135/9781848608191

Audretsch, D. B. (2006). The Knowledge Spillover Theory of Entrepreneurship and Economic Growth. *Research on Technological Innovation, Management and Policy*, 9(05), 37–54. doi:10.1016/S0737-1071(05)09003-7

Bhatti, Y. A. (2012). What is Frugal, What is Innovation? Towards a Theory of Frugal Innovation. *SSRN Electronic Journal*, 1–45. doi:10.2139/ssrn.2005910

Bloom, L. & Faulkner, R., 2016. Innovation spaces: lessons from the United Nations. Third World Quarterly, 6597(March), pp.1–17. Available at: http://www.tandfonline.com/doi/full/10.1080/01436597.2015.1135730.

Bryman, A. (2004). Social Research Methods. *Social Research (Vol. 2nd)*. doi:10.4135/9781849209939

Camps, S., & Marques, P. (2013). Exploring how social capital facilitates innovation: The role of innovation enablers. *Technological Forecasting and Social Change*. doi:10.1016/j.techfore.2013.10.008

Carlsson, B., Acs, Z. J., Audretsch, D. B., & Braunerhjelm, P. (2008). Entrepreneurship, Knowledge, and Economic Growth. *Foundations and Trends in Entrepreneurship*, 4(5), 451–533. doi:10.1561/0300000013

Chambers, R. (1994). Participatory Rural Appraisal (PRA): Challenges, Potentials and Paradigm. *World Development*, Vol. 22 (No. 9) (1994), pp. 1253–1268

Chambers, R. 2004. *Ideas for development: Reflecting forwards, IDS Working Paper 238*, Brighton, UK: Institute of Development Studies.

Lundvall, B-A., Joseph, KJ., Chaminade, C. and Vang, J. (2009) Handbook of Innovation Systems and Developing Countries, pp. 360-379.

Chew, H. E., Ilavarasan, V. P., & Levy, M. R. (2013). Mattering Matters: Agency, Empowerment, and Mobile Phone Use by Female Microentrepreneurs. Information Technology for Development, 21(4), 523–542. doi:10.1080/02681102.2013.839437

Clark, D. a. (2005). The Capability Approach: Its Development, Critiques and Recent Advances. Economics Series Working Papers, 18. doi:10.1007/s10550-005-0106-2

Cohen, W. M. and D. A. Levinthal (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. Administrative Science Quarterly 35(1): 128-152.

Corbridge, S. (2002). Development as freedom: the spaces of Amartya Sen. *Progress in Development Studies*, 2(3), 183–217. doi:10.1191/1464993402ps037ra

Damanpour, F., & Schneider, M. (2008). Characteristics of Innovation and Innovation Adoption in Public Organizations: Assessing the Role of Managers. *Journal of Public Administration Research and Theory*, 19(3), 495–522. doi:10.1093/jopart/mun021

Davis, F.D., (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), pp.319–340.

Dess, G. G., & Picken, J. C. (2000). Changing roles: Leadership in the 21st century. *Organizational Dynamics*, 28(3), 18–34. doi:10.1016/S0090-2616(00)88447-8

Duguid, P. (2005). "The Art of Knowing": Social and Tacit dimensions of Knowledge and the Limits of the Community of Practice. *The Information Society*, 21: 109–118., 21, 109–118.

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review*, 14(4), 532. doi:10.2307/258557

Everett, R. M. (1995). Diffusion of innovations 4th ed. *Technovation* (Vol. 2). The Free Press. doi:10.1016/0166-4972(84)90018-X

Fischer, G. (2001). Communities of Interest: Learning through the Interaction of Multiple Knowledge Systems. In *Proceedings of the 24th IRIS Conference*, 2001 (Vol. 1, pp. 1–13). Department of Information Science, Bergen. Retrieved from http://home.himolde.no/~molka/in765/Communities-of-Interest.pdf

Freeman, C. (2002). Continental, national and sub-national innovation systems: complementarity and economic growth. *Research Policy*, 31(2), 191–211. doi:10.1016/S0048-7333(01)00136-6

Gathege, D., & Moraa, H. (2013). Draft Report On Comparative Study On Innovation Hubs Across Africa. Retrieved from http://research.ihub.co.ke/uploads/2013/may/1367840837__923.pdf

George, G., McGahan, A. M., & Prabhu, J. (2012). Innovation for Inclusive Growth: Towards a Theoretical Framework and a Research Agenda. *Journal of Management Studies*, 49(4), 661–683. doi:10.1111/j.1467-6486.2012.01048.x

Giddens, A. (1989) A reply to my critics in *Social Theory of Modern Societies: Anthony Giddens and His Critics*. In D. Held and J. B. Thompson (eds), 249–305. Cambridge: Cambridge University Press.

Gitau, S., Plantinga, P., & Diga, K. (2010). ICTD Research by Africans: Origins, Interests, and Impact. *The African Journal of Information Systems*, 4(4), 120–136.

Glaser, B. G., & Strauss, A. L. (1967). The discovery of grounded theory. *International Journal of Qualitative Methods* (Vol.5). Huber. Retrieved from http://www.ualberta.ca/~iiqm/backissues/5_1/pdf/mills.pdf

GSMA Mobile for Development. (2014). Digital Entrepreneurship in Kenya. Retrieved from http://www.gsmaentrepreneurshipkenya.com/GSMA_KENYA-AR2014-060214-WEB-SINGLE-PGS.pdf

Haq, M. U. (1999). Reflections on Human Development. Karachi: Oxford University Press.

Heeks, R., Amalia, M., Robert, K., & Shah, N. (2013). Development Informatics. *The Development Informatics* (Vol. 53). Manchester. doi:10.1016/0736-5853(84)90003-0

Heunks, F. J. (1998). Innovation, Creativity and Success. *Small Business Economics*, 10(3), 263–272. doi:10.1023/A:1007968217565

Hyvärinen, L. (1990). Innovativeness and its Indicators in Small and Medium-sized Industrial Enterprises. *International Small Business Journal*, 9(1), 64–79.

Ibrahim, Solava & Alkire, Sabina (2007) *Agency & Empowerment: a proposal for International Comparable Indicators*, OPHI Working Paper, Oxford, OPHI.

Ibrahim, S. S. (2006). From Individual to Collective Capabilities: The Capability Approach as a Conceptual Framework for Self-help. *Journal of Human Development*, 7(3), 397–416. doi:10.1080/14649880600815982

Inkpen, A. C., & Tsang, E. W. K. (2005). Social Capital, Networks, and Knowledge Transfer. *Academy of Management Review*. doi:10.5465/AMR.2005.15281445

Kara, O., & Pamukçu, M. T. (2011). Innovation Capability for Development: an attempt to apply Amartya Sen' s Capability Approach to Innovation Studies. The Human Development and Capability Association (HDCA). Retrieved June 20, 2014, from https://hd-ca.org/publications/innovation-capability-for-development-an-attempt-to-apply-amartya-sens-capability-approach-to-innovation-studies

Kesidou, E., & Romijn, H. (2008). Do Local Knowledge Spillovers Matter for Development? An Empirical Study of Uruguay's Software Cluster. *World Development*, 36(10), 2004–2028. doi:10.1016/j.worlddev.2008.01.003

London, T. (2008). The Base-of-The-Pyramid Perspective: A New Approach to Poverty Alleviation. *Proceedings of the sixty-sixth annual meeting of the Academy of Management* (CD (2008) ISSN 1543-8643

Mccormick, D. (2011). Innovation Hubs and Small and Medium Enterprises in Africa. *Africa Setting the Policy Agenda*, University of Nairobi, Nairobi, Kenya.

Miles, M. A. (1994). Miles and Huberman (1994)- Chapter 4.pdf. In Qualitative Data Analysis: An Expanded Sourcebook (pp. 50–72).

Mone, M. A., Mckinley, W., & Barker, V. L. (1998). Organizationak Decline and Innovation: A Contingency Framework. *The Academy of Management Review*, 23(1), 115–132.

Nelson, E. R. (ed.) 1963. National Innovation Systems: A Comparative Analysis*, Oxford, Oxford University Press

Nussbaum, M. (2001). Women and Human Development: The Capabilities Approach. (Cambridge University Press, Ed.). The University of Chicago.

Nussbaum, M. (2003). Capabilities As Fundamental Entitlements: Sen and Social Justice. *Feminist Economics*, 9(2-3), 33–59. doi:10.1080/1354570022000077926

Nussbaum, M. C., & Sen, A. (1993). The Quality of life / edited by Martha Nussbaum and Amartya Sen. WIDER studies in development economics. Oxford [England] : Clarendon Press ; New York : Oxford University Press, 1993.

OECD. (2012). Innovation and Inclusive Development: Discussion Report.

Radcliffe, S. A. (1999). Reimagining the nation: community, difference, and national identities among indigenous and mestizo provincials in Ecuador. *Environment and Planning*, 31(1), 37–52. doi:10.1068/a310037

Ramani, S. V., & Mukherjee, V. (2013). Can breaktrhough innovations serve the poor (bop) and create reputational (CSR) value? Indian case studies. *Technovation*, 34(5-6), 295–305. doi:10.1016/j.technovation.2013.07.001

Robeyns, I. (2000). An Unworkable Idea or a Promising Alternative? Sen's capability approach re-examined. Retrieved from
https://merode.econ.kuleuven.ac.be/eng/ew/discussionpapers/Dps00/DPS0030.pdf

Robeyns, I. (2006). The Capability Approach in Practice. *Journal of Political Philosophy*, 14(3), 351–376. doi:10.1111/j.1467-9760.2006.00263.x

Rocha, H., & Miles, R. (2009). A Model of Collaborative Entrepreneurship for a More Humanistic Management. *Journal of Business Ethics*, 88(3), 445–462. doi:10.1007/sl0551-009-0127-8

Rochina-Barrachina, M. E., Manez, J., & Sanchis-Llopis, J. A. (2010). Process Innovations and Firm Productivity Growth. *Small Business Economics*, 34(2), 147–166. doi:10.1007/sl

Rogers, E.M., (1995). Diffusion of Innovations M. B. Salwen & D. W. Stacks, eds., Free Press.

Rye, S.A., (2009). Negotiating the Symbolic Power of Information and Communication Technologies (ICT): The Spread of Internet-Supported Distance Education. *Information Technology for Development*, 15(1), pp.17–31.

Schumpeter, J. A. (1934). The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle. *Harvard Economic Studies* (Vol. 46). Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1496199

Schmidt, S., Erkner, V.B. & Brinkhoff, S., (2015). Schmidteetal_2015_creative_labs.pdf. *Zeitschrift fur Wirtschaftsgeographie*, 58(4), pp.232–247.

Sen, A. (1999). Development as Freedom. *Common Knowledge* (Vol. 9). Oxford: Oxford University Press. doi:10.1215/0961754X-9-2-350

Smith-Doerr, L., Manev, I. M., & Rizova, P. (2004). The meaning of success: network position and the social construction of project outcomes in an R&D lab. *Journal of Engineering and Technology Management*, 21(1-2), 51–81. doi:10.1016/j.jengtecman.2003.12.004

Srinivas, S., & Sutz, J. (2008). Developing countries and innovation: Searching for a new analytical approach. *Technology in Society*, 30(2), 129–140. doi:10.1016/j.techsoc.2007.12.003

Stewart, F. (2004). Groups and Capabilities. In Paper prepared for the "*Fourth Conference on the Capability Approach: Enhancing Human Security*". University of Pavia, Italy, 5-7 September 2004.

Toivonen, T. & Friederici, N., 2015. Time to define what a "hub" really is. *Stanford Social Innovation Review*, pp.1–37.

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous organizations: managing evolutionary and revolutionary change. *California Management Review*, 38(4), 8–30. doi:10.1080/09652540903536982

Walsham G (2001) Making a World of Difference: IT in a Global Context. Chichester: Wiley.

Wang, C. L., & Ahmed, P. K. (2004). The Development and Validation of the Organisational Innovativeness Construct Using Confirmatory Factor Analysis. *European Journal of Innovation Management*, 7(4), 303–313. doi:10.1108/14601060410565056

Wells, T. (2012). Sen's Capability Approach-Wels 2012. Retrieved November 19, 2015, from http://www.iep.utm.edu/sen-cap/

Williams, L. D. a., & Woodson, T. S. (2012). The Future of Innovation Studies in Less Economically Developed Countries. Minerva, 50(2), 221–237. doi:10.1007/s11024-012-9200-z

Willis, K. (2005). Theories and practices of development. Routledge Perspectives on Development. Routledge. ISBN0-203-50156-X

Xiao, X. et al., (2013). ICT innovation in emerging economies: A review of the existing literature and a framework for future research. *Journal of Information Technology*, 28(4), pp.264–278. Available at: http://dx.doi.org/10.1057/jit.2013.20.

Yin, R., 2004. Case Study Research: Design and Methods. *Sage Publications*, 5(3).

Yli-Renko, H., Autio, E., & Sapienza, H. J. (2001). Social capital, knowledge acquisition, and knowledge exploitation in young technology-based firms. *Strategic Management Journal*, 22(6-7), 587–613. doi:10.1002/smj.183

Zeschky, M., Widenmayer, B., & Gassmann, O. (2011). Frugal Innovation in Emerging Markets. *Research-Technology Management*, 54(4), 38–45. doi:10.5437/08956308X5404007

Zheng, Y. (2007). Exploring the Value of the Capability Approach for e-development. In *Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries*. Sao Paulo, Brazil.

Zheng, Y., (2015). Critical Overview of Theory. In Peng Hwa, ed. *International Encyclopaedia of Digital Communication And Society*. Wiley-Blackwell.