

ARTICLES

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IMPROVING FINANCIAL INCLUSION: TOWARDS A CRITICAL FINANCIAL EDUCATION FRAMEWORK

Aprimorando a inclusão financeira: Rumo a um quadro teórico de educação financeira crítica

Mejoramiento de la inclusión financiera: Hacia un marco de educación financiera crítica

ABSTRACT

Empirical research suggests that financial inclusion initiatives – such as facilitating access to financial resources or providing microcredit – are alone not enough to lower socioeconomic disparities. In this article, we adopt a critical stance as a guide for our empirical investigation. Our aim is to propose a financial education framework, tailored to low-income micro-entrepreneurs, that embraces new information and communication technologies (ICTs) and seeks to improve financial inclusion and social emancipation. This empirical study was conducted in an Amazonian municipality in Brazil where recent access to ICTs has brought about important and varied socioeconomic changes. Results show that ICT-supported and tailored critical financial education can play a dual role: on the one hand, access to financial education might decrease the effects of generative mechanisms on global/local tensions, triggered by standardized ICT applications; on the other hand, such access might increase financial inclusion and social transformation through the integration of guiding principles into financial education programs.

KEYWORDS | Financial education, financial inclusion, Information and Communication Technology for Development, social emancipation, empowerment.

RESUMO

Pesquisas empíricas sugerem que iniciativas de inclusão financeira – tais como o acesso a recursos financeiros ou o fornecimento de microcrédito – não são, por si sós, suficientes para reduzir as disparidades socioeconômicas. Neste artigo, adotamos uma abordagem crítica para guiar a nossa pesquisa empírica. Nosso objetivo é o de propor um quadro teórico para a educação financeira orientada a microempreendedores de baixa renda, vinculado às novas tecnologias de informação e comunicação (TICs), com o propósito de ampliar a inclusão financeira e a emancipação social. Este estudo empírico foi realizado em um município da Amazônia brasileira no qual o recente acesso às TICs resultou em significativas e divergentes transformações socioeconômicas. Os resultados evidenciam que a educação financeira crítica orientada por TICs pode desempenhar um duplo papel: por um lado, o acesso à educação financeira pode reduzir os efeitos provocados por mecanismos geradores de tensões globais-locais, desencadeados pelo uso de aplicações padronizadas de TICs; por outro lado, tal acesso pode aumentar a inclusão social e a transformação social por meio da incorporação de princípios norteadores, integrados a programas de educação financeira.

PALAVRAS-CHAVE | Educação financeira, inclusão financeira, Tecnologia da Informação e Comunicação para o Desenvolvimento, emancipação social, empoderamento.

RESUMEN

La investigación empírica sugiere que las iniciativas de inclusión financiera –tales como la facilitación del acceso a recursos financieros o la concesión de microcréditos– solas no son suficientes para reducir las disparidades socioeconómicas. En el presente trabajo, adoptamos una postura crítica como guía de nuestra investigación empírica. Nuestro objetivo es proponer un marco de educación financiera, a la medida para microempresarios de bajos ingresos, que abarca las nuevas tecnologías de la información y la comunicación (TIC) y busca mejorar la inclusión financiera y la emancipación social. El estudio empírico se llevó a cabo en un municipio amazónico Amazonas del Brasil, donde el reciente acceso a las TIC ha producido cambios socioeconómicos importantes y variados. Los resultados muestran que la educación financiera crítica a medida, respaldada por las TIC, puede desempeñar un doble papel: por un lado, el acceso a la educación financiera podría disminuir los efectos de los mecanismos generadores de tensiones globales/locales, disparados por aplicaciones TIC normalizadas; por otro lado, este acceso podría aumentar la inclusión financiera y la transformación social, a través de la integración de principios rectores en los programas de educación financiera.

PALABRAS CLAVE | Educación financiera, inclusión financiera, y Tecnología de la Información y la Comunicación para el Desarrollo, emancipación social, empoderamiento.

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INTRODUCTION

Financial inclusion of low-income micro-entrepreneurs living in less developed economic regions is a phenomenon that has been addressed by a number of scholars (Fernando, 2006; Fouillet, Guérin, Morvant-Roux, Roesch, & Servet, 2007; Mayoux, 2010; Parikh, 2006; Rhyne & Otero, 2006). Between 2011 and 2014, 700 million people worldwide became first-time bank account holders with the number of the unbanked dropping in that period by 20% to 2 billion. This growth in account penetration represents 13% of the population in developing economies. Yet large opportunities remain to increase financial inclusion, especially among women and the poor (Kunt, Klapper, Singer, & Oudheusden, 2015).

Worth noticing are branchless banking networks – commonly known as banking agents – which have enabled significant access to financial services to low-income populations who live in remote locations (Diniz, Cernev, Gonzalez, & Albuquerque, 2012). Banking agents are ICT-enabled points of service installed by banks on a partnership basis with non-bank businesses such as supermarkets, pharmacies, grocery stores, post offices and other types of retail establishment across the Brazilian territory, many of which are located in previously underserved, low-income areas. In the context of Latin America, these branchless banking networks are managed by private banks, operated by retailers and fully supported by information and communication technologies (ICTs) (Mas, 2009). As banking agents' networks, when supported by a reliable ICT-based infrastructure, seem able to help promote local economic development, these networks figure as more feasible alternatives for expanding banking services than conventional banks (Mettenhein, Diniz, & Gonzalez, 2014). Providing access to financial services for low-income populations through banking agents' networks enables social innovation through new technologies and the reduction of transaction and investment costs associated with bank branches (Faz & Moser, 2013).

In this context, Brazil provides an exemplary illustration of large-scale deployment of banking agents' networks targeting financial access. The striking increase in financial services access points, which operate through banking agents across the country, is indicative that this initiative is an effective means of promoting broad access to financial services, potentially enabling the financial inclusion of low-income micro-entrepreneurs, who are a far from negligible segment in the Brazilian economy. On the contrary, they represent more than 90% of the new businesses launched in the last five years (SEBRAE, 2010) and, according to some authors, are priceless contributors to social innovation (Diniz et al., 2013; Yunus, Moingeon, & Lehmann-Ortega, 2010).

However, access to financial resources seems to be a necessary but not sufficient condition for the promotion of financial inclusion of poor communities. Parallel to the growth of access to financial services, it is recognized that educational activities are one of the most important components in the convergence between the emergence of new technologies and the practices of financial inclusion (Diniz, Birochi, & Pozzebon, 2012; Xu & Zia, 2012). In this context, financial education is an important tool in promoting empowerment of the poor (Mayoux, 2010). Purposeful educational approaches are required to promote significant social transformations. For instance, isolated intervention to encourage people to use new technology and devices and to take part in financial processes will only produce limited results, if any. In other words, an instrumental approach to how mechanisms and processes work in the financial system may be just an initial step in overcoming the information gap, and would not suffice to promote new users' empowerment. Therefore, to ensure that education has a lasting effect on social emancipation, developmental initiatives must be broader than just providing training programs based on financial education.

In this article, we advance the argument that there is a need for an ICT-supported financial education framework tailored from a critical perspective to empower financial services' users and to overcome their socioeconomic exclusion. We argue that one avenue to overcome global/local tensions – often triggered by standardized top-down financial education initiatives – is to combine ICT-based artifacts with a critical approach to provide tailored, customized financial inclusion programs for low-income micro-entrepreneurs. We consider global as any processes or activities dependent of decisions taken by actors situated outside the local context. To achieve this, our empirical research seeks an answer to the following research question: what are the guiding principles of an ICT-supported financial education framework that can help to improve financial inclusion and social emancipation, particularly of low-income micro-entrepreneurs?

Our study draws two main findings. Firstly, we identify factors (triggers) that generate tensions between the local and global spheres, from the perspective of low-income micro-entrepreneurs and their relationship to ICT artifacts. Understanding and managing those generative mechanisms are of crucially practical importance for practitioners who seek to implement inclusive financial programs in remote locations. Secondly and more importantly, we identify guiding principles which may help target ICT-supported financial education programs tailored by a critical perspective. This is important since our experience shows that most financial education initiatives applied in remote Brazilian regions are top-down programs using standardized principles from different cultural contexts.

This article comprises five sections: after this introduction, we present the theoretical background, the conceptual framework and the methodological design. Then we present and discuss our results and our conclusions.

THEORETICAL BACKGROUND

In this section, we present the main theoretical perspectives on financial education, their concepts and main definitions. We also discuss the use of ICTs for education in low-income communities.

Financial education

Currently, there is no single standard definition of the term financial education. Instead, there is a wide range of meanings and correlated terms. The terms financial education and financial literacy may be viewed as synonyms; they are both related to a modality of education targeting the understanding of products, services and financial processes, such as savings, credit and investments (OECD, 2006). These terms also aim to promote individuals' financial skills and skill development in order to encourage behavioral change for better resource management.

The Organisation for Economic Co-operation and Development (OECD) and the National Endowment for Financial

Education (NEFE) define financial literacy as the ability to read, analyze, manage, and communicate about the personal financial conditions that affect material well-being. In line with this definition, we can relate financial education to processes such as teaching how to operate a financial calculator, calculations to estimate pensions, knowledge about investing in stock markets and credit and savings operations. It is also worth stressing that financial education is generally not concerned with business management issues, such as running businesses, sales and marketing planning or teaching how to create a business plan (Micro Insurance Agency, 2008). Overall, the literature has highlighted a positive correlation between financial education for developing financial skills and behavior change among underprivileged clients (Cole, Sampson, & Zia, 2009; Sabbaghi, Cavanagh, & Hipskind, 2013; Servon & Kaestner, 2008).

Financial education: Instrumental or transformative

The literature on financial education can be broadly divided into two major streams that we call instrumental and transformative or critical (Exhibit 1). Both aim at the mitigation and reduction of poverty, drawing on financial education as a tool to enable the social inclusion of financially disadvantaged individuals. However, the values and principles behind these streams are essentially different.

Exhibit 1. Two financial education streams

Financial education streams	Major underpinnings	Objectives	Authors
Instrumental	Financial education should promote efficiency and effectiveness of the financial system, through co-responsibility of the individuals (rights and liabilities). Individuals are consumers	Financial education should act as a tool to improve the overall efficiency of the financial system, through training programs based on mastering of operational capabilities (knowledge about credit, debt, budget and negotiations)	Cole et al. (2009); Servon & Kaestner (2008); CGAP (2005)
Transformative or critical	Humanitarian and social approach. Individuals (low-income micro-entrepreneurs) have huge socioeconomic constraints. Improvements are achieved by strengthening individual capabilities	Financial education should aim at social-economic inclusion through strengthening of individual capabilities, targeting individual empowerment and social emancipation	Cabraal (2011); Landvogt (2006); Burkett & Sheehan (2009); Sempere (2009); Johnston & Maguire (2005); Mayoux (2010); Augsburg & Fouillet (2010); Fernando (2006)

Instrumental approaches are based on perspectives oriented towards maintaining the prevailing economic system (Fernando, 2006). An example of an instrumental practice is the transferring of financial management responsibility to underprivileged individuals, who should be jointly liable for the credit obtained, based on the premise that the financial system is dependent on efficient resource management (Fouillet et al., 2007). In this context, financial education is used as a tool to improve the overall efficiency of the financial system. This current of thought configures financial education in terms of two complementary axes: individuals who perform consumer roles in financial services and their counterparts, i.e., financial service providers, including the various types of financial institutions that supply and manage these resources.

For individuals, financial education initiatives focus on aspects such as awareness of consumer protection laws and legal requirements for transparency and availability of information – e.g. disclosing the risks involved in transactions and means of preventing or adjusting them to the consumer's profile (CGAP, 2005). Conversely, financial institutions are interested in minimizing their financial losses, increasing their profits and transferring the responsibility for potential financial misuse and mismanagement to customers (Augsburg & Fouillet, 2010; Mayoux, 2010). The instrumental view of financial education privileges the prevailing system to the detriment of the individual's well-being. Its focus is instrumental due to its initiatives being based on knowledge acquisition for improved performance, efficiency and effectiveness. Thus, this modality of financial education targets skill development and training, rather than education *per se*.

The second current – i.e. transformative financial education – encompasses a set of alternative proposals, focused on humanitarian and social concerns, individual empowerment, social emancipation and the pursuit of freedom (Cabral, 2011). Transformative financial education sees the prevailing socioeconomic system as the cause of poverty (Landvogt, 2006). Improvements are achieved by strengthening individual capabilities. The aim is to transform individuals, as well as the dominant system, by empowering and potentially emancipating them. It seeks to incorporate financial education as a means of transforming the socioeconomic conditions of poor individuals, thus acting as an instrument of poverty mitigation through development of individual capabilities (Cabral, 2011). Some of these practices are based on concepts proposed by Sen (1999), who regards capability development as an important pathway to freedom. In this context, education, particularly financial education, plays a key role in promoting individual freedom. In this article we highlight two transformative approaches, namely:

critical financial capabilities education and financial numeracy education.

Critical financial capabilities education

The first approach, proposed by Landvogt (2006), is practice-based and is described as a bottom-up approach. It was influenced by the academic work of Burkett (2003). Landvogt (2006) sought to integrate concepts derived from Amartya Sen's and Paulo Freire's studies. From Sen's work (1999), the author incorporated the concept of individual capabilities in order to expand the concept of literacy, which is too closely associated with knowing how to read and write. Development is not restricted to issues related to economic growth; rather, it refers to expanding various capabilities that enable individuals to experience complete freedom. The author's suggestion of the term financial capabilities, rather than financial education, is attributed to Sen's work. Freire's (1993) contribution is related to the critical dimension, which aims to challenge the prevailing system, as well as crucial elements of critical educational practice, such as critical thinking, problem-posing, debate and critical awareness. The author also borrows the term banking education from Freire to criticize prevailing financial education, which, according to her, is a self-proclaimed knowledge bank (Landvogt, 2006, p. 13) able to uniformly transfer its educational content, regardless of context. The author also claims that there is no need to propose new concepts based on the dominant practices in financial education. Instead, it is more important to produce a critical approach from existing practices, one which takes into account the information provided by the local scenario to customize financial education programs.

In addition to this approach, we draw attention to the REFLECT method (Sempere, 2009) - Regenerated Freirean Literacy through Empowering Community Techniques. This method is considered the most relevant international approach, and is currently used by over 500 organizations in over 70 countries (www.reflect-action.org), to strengthen people's capacity in communication skills, using relevant, available media in different social contexts (Okech & Torres, 2005). The method is based on an awareness that achieving social change and social justice is, fundamentally, a political process. REFLECT is not a neutral method which aims to promote a neutral vision of development focused only on improving people's material conditions. Rather, REFLECT aims to help people fight for their rights and against injustice, to foster change in social conditions. Freire's theoretical principles constitute the basis for REFLECT. In summary, the ten key principles of this method are presented below (Exhibit 2).

Exhibit 2. REFLECT's ten principles

Key principles	Objectives	Actions
Political process	To help people in the struggle to assert their rights, challenge injustice and change their position in society	It involves working "with" people rather than "for" them
Creating democratic spaces	Everyone's voice is given equal weight	This needs to be actively constructed, as it does not naturally exist. People everywhere are stratified by gender, age, hierarchy, status, ability, etc.
Intensive and extensive process	Intensity of contact on an ongoing basis	Groups meet at least twice a week for at least 2 years
Grounded in existing experience/ knowledge	Respect for people's existing knowledge and experience, without accepting people's pre-existing opinions and prejudices without challenge	Give people control over that process and confidence in their own starting point - so that they can be critical and selective as they access new information and knowledge
Reflection/action/reflection	REFLECT involves a continual cycle of reflection and action.	Action may be in the public or private sphere; it may be collective or individual; small scale or large scale. Some actions may be very local and others may require linkages beyond the local level to national level mobilisation.
Participatory tools	A wide range of participatory tools is used to help create an open or democratic environment in which everyone is able to contribute	Visualization approaches and creative/ art-based processes: theatre, songs, dance, video, photography, etc
Power analysis	Multiple dimensions of power and stratification are always the focus of reflection and actions	Actions are oriented towards changing inequitable power relationships
Enhancing capacity to communicate	Strengthen people's capacity to communicate by whatever means are most relevant to them	Learning new communication skills in a meaningful way
Coherence	REFLECT is an approach that needs to be used systematically	The same principles and processes apply to facilitators, trainers, managers or national coordinators as to participants at grassroots level
Self-organisation	Promoting self-organisation	Participants are encouraged to organise for themselves, based on their own analysis and their own agenda

These principles seek to strengthen individual capacities, such as those proposed in Sen's capability approach, which recommends collective mobilization and action. From this position, we emphasize the closeness of the capability approach as proposed by Sen with the principles proposed by Freire's critical perspective.

To incorporate REFLECT principles (Exhibit 2), financial education programs intend to show that individual actions are the result of problems posed and debated on the social and economic implications of using financial products, processes and services. In other words, instead of concentrating solely on explanations regarding information about a certain financial service or product (the what?), or even on how best to use these services (the how?), the critical approach of financial education, guided by REFLECT principles, mainly focuses on raising questions on the hidden interests of these products and services and the potential unseen consequences for individuals and communities/social groups (the why?). This way, REFLECT helps empower and socially emancipate individuals, instead of being restricted to merely concentrate on access to financial information, which is one of the characteristics of instrumental approaches.

Among these ten principles we highlight what Freire (1993) described as a social practice (*praxis*) resulting from a continuous process of critical reflection and action (reflection / action / reflection).

Financial numeracy education

Numeracy is a complex, multifaceted, sophisticated construct that incorporates "the mathematics, cultural, social, emotional and personal aspects of each individual in a particular context" (Maguire & O'Donoghue, 2003, p. 155). The sociologist Joel Best argues that numbers in the news "are socially constructed and that, accordingly, quantitative literacy education needs to include consideration of the social dynamics of numbers-use as well as the mathematics" (Vacher & Wallace, 2008, p. 1). In this sense, numeracy can be considered a construct of math practices aligned with the critical approaches of education, such as those proposed in the critical pedagogy of Freire, approaches intended to achieve the transformation of the individual through meaningful learning and critical reflection.

According to Johnston and Maguire (2005, p. 59), financial numeracy education should not be viewed as "a closed model, confined to local projects, but a policy proposal centered on a strategy for education and learning for economic and social development and transformation at the local level". The authors, therefore, establish a link between the particularities

of the context, which are geared towards poverty alleviation and large-scale initiatives focused on the structural causes of this phenomenon. In this process, numeracy is an excellent tool for linking micro and macro levels. Since mathematical knowledge can be easily generalized, it may employ applied examples without losing its abstract quality, thus making it suitable to other contexts. Highlighted below are some summaries of financial numeracy education:

- Financial education must encourage and promote critical thinking, enabling individuals to identify prevailing interests through the analysis of structures and social and economic systems; one of its main goals is the empowerment of individuals;
- Financial education should relate to literacy, including activities focused on individuals' way of life (their characteristics, needs, particularities of their lives and subsistence); knowledge must be meaningful and applied to the local context;
- Financial education must include dialogue/debate as an educational practice; community participative approaches – based on cooperative and supportive teaching practices, rather than on individual interests – must be promoted.

During our literature review on financial education, we searched for elements which could work as guidelines for our fieldwork. Our intention was to identify elements to help in the design of a financial education framework. We believe that this framework should follow a transformative financial education approach, since our goals include empowerment and social emancipation. Our review shows that REFLECT is one of the main programs working in such an emancipatory vein. We identify ten solid principles: (1) Attention to political process; (2) Creation of a democratic space; (3) A focus on an intensive and extensive process; (4) Process grounded in existing experience/knowledge; (5) An iterative process of reflection/action/reflection; (6) Tools required for inclusion/participation; (7) The need to analyze power dynamics; (8) The need to enhance people's capacity to communicate; (9) A coherent axis between all implemented practices; and (10) The promotion of self-organization. From these principles we highlight social practice, which is the result of a continuous process of reflection, action, reflection, with the aim of social transformation. Finally, from a critical view of financial numeracy, we identify three elements: (1) Critical thinking; (2) Meaningful and contextualized knowledge; (3) Dialogue/debate.

The use of ICTs in low-income communities

According to [Rahman \(2006\)](#), ICT artifacts and applications are one of the most important means of low-income communities' empowerment. ICTs promote the dissemination of information and knowledge and mediate skills and capabilities acquisition. Access to technology is viewed as the beginning of a long process of digital inclusion that might lead to individual empowerment. Certain authors have, however, raised the issue of great importance being placed on access to ICTs by low-income populations before even determining the role played by information and knowledge exchange for local development ([Adeya, 2002](#); [Mansell & Wehn, 1998](#)). According to [Kinsley \(1998, p. 23\)](#), "the effective use of information must become an integral part of all aspects of community development. The infrastructure may be global, but its applications and impacts may only be determined by local human conditions".

As reported by [Parker \(2013\)](#), when ICTs are used as electronic benefit transfer, such as the program implemented in Andhra Pradesh in India, the results have been reported to be a great success. E-payments increase payment convenience for recipients who report a high level of trust in the ICTs' system. Nevertheless, the program failed to take potential opportunities to empower poor women through access to new technologies such as mobile phones; and, most importantly, the "link to financial inclusion fails because of poor information access". In this sense, some financial education programs that do not support the expansion of financial inclusion for low-income micro-entrepreneurs, who use ICTs in their businesses, represent important gaps to be overcome.

Alternatively, beyond the use of electronic cards or mobile phones in poor communities, public telecenters have been developed through a set of government-fostered social innovation strategies that seek to promote social and digital inclusion for low-income populations ([Mello, 2012](#); [Pozzebon & Diniz, 2012](#)). Despite the fact that social inclusion models based on telecenters have provided mixed results regarding sustainability ([Best & Kumar, 2008](#)), initiatives continue to proliferate, incorporating actions that interrelate access to ICTs with microfinance ([Hart & Christensen, 2012](#)), supported, in some cases, by literacy education.

An example of an innovative inclusive model is provided by Grameen Telecom, a Grameen Bank initiative in Bangladesh, which launched the village phone, a project that offers telecommunication services to low income people, enabling poor women to act as mobile payphone operators and allowing poor individuals to access communications more easily ([Hart & Christensen, 2012](#)). Further examples of emergent business

models are those maintained by private companies such as N-Logue ([Jhunjhunwala, Ramachandran, & Bandyopadhyay, 2004](#); [Paul, 2004](#)), called information kiosks, which provide access to information and communication technology for low income people in rural villages. This model focuses on business proximity to consumers, demand aggregation and entrepreneurial incubation ([Sama & Casselman, 2013](#)). In accordance with [Sama and Casselman \(2013\)](#), the authors [Cecchini and Raina \(2004, p. 73\)](#) go further to suggest that the success of these telecenters is increased due to "[...] community participation and ownership, as well as implementation of the project by grassroots-based organizations who have the appropriate incentives to work with marginalized groups".

Analyses emphasizing the local context ([Avgerou, 2008](#); [Walsham, 1995](#)), when studying the use and impact of ICTs in low-income communities, highlight the socioeconomic and cultural aspects in which information systems are embedded, accounting for local social and organizational structure. There is a profound interdependence between technology and the social context ([Orlikowski, 2000](#)). Technology use is enacted by individuals in their contexts through constant interpretation, meaning attribution and appropriation of artifacts. Some authors believe that ICTs are deeply rooted in social and institutional structures that continue to perpetuate inequalities between socioeconomic elites and marginalized groups in society ([Gigler, 2006, 2015](#); [Gigler & Bailur, 2014](#); [Mansell, 2004](#)). According to them, socioeconomic structures of domination are reproduced in ICTs as an extension of current models of socioeconomic inequality, thereby acting as a kind of natural barrier to inclusion of excluded groups in the system. So, how can ICTs enable empowerment?

The proliferation of ICTs together with social, digital and financial inclusion initiatives have been increasing expectations of ICTs as empowerment tools. However, access to ICTs should be complemented with services such as capacity building in the use of ICTs, delivery of local content, and access to government service ([Gigler & Bailur, 2014](#); [Madon, 2003](#)). Merely giving access is neither a guarantee of the empowerment of poor communities nor of social transformation.

An example of a social and digital inclusion initiative is provided by the *Fundação Banco do Brasil* (FBB) through the implementation of social technologies, i.e., social and technological innovations that seek to promote social change. The FBB has created around 1,000 telecenters across Brazil, which function as platforms for promoting local knowledge and content development. This social and digital inclusion initiative seeks to articulate a network of people across different territories, to build a process of education based on the capacity of producing new content and the implementation of a supportive technological

infrastructure (Mello, 2012). The initiative is supported by a web portal called “knowledge that changes”, which also offers financial literacy as one of the modalities of ICTs-mediated education.

Gigler’s analysis (2006) on the use of ICTs in low-income communities in Latin America outlines a few propositions aimed at overcoming the dichotomies between the uses of ICTs as tools of control versus the transformative power of ICTs. For the purposes of our paper, the most important propositions are: (a) capacity building activities: in order to promote meaningful use of ICTs locally, capacity building activities and local content provided by intermediaries are both aspects of paramount importance that potentially affect ICT programs for skill strengthening, thus contributing to better quality of life; (b) local content development: lesson-learning and content sharing within the local community result in more relevant benefits, in which individuals learn from one another; and (c) integration of ICTs in pre-existing social structures of the community: the potential benefits of ICTs are larger when they are fully integrated “into other sectoral development programs as, for example, in education or health”. In his latest work, Gigler (2015, p. 34) suggests that for ICT projects to work “a quite complex process needs to take place for ICTs to have an impact on the lives of poor communities”. This process is made up of five stages:

1. Information needs: assessing information needs, the existing information capital, systems and information ecology;
2. ICT uses: providing ICT access; enabling local uses of ICTs;
3. ICT capabilities: building capacity to use, appropriate and shape ICTs. Creating local and relevant content;
4. Informational capabilities: strengthening capabilities to access, process, and evaluate information through ICTs;
5. Human and social capabilities: the catalytic role of ICTs to strengthen human and social capabilities. Achieving local ownership, trust and sustainability.

Gigler (2006, 2015) based his assertions on Sen’s (1999) conceptual framework of human development, in which the development of individual ICT capabilities gives individuals increased control over their choices. In this context, both information and ICTs may contribute to the empowerment of

underprivileged people. Hence, the use of technology may be viewed as a step towards the social emancipation of individuals. Therefore, technology may function as a catalytic agent promoting individual freedom.

From our literature review of ICTs in low-income communities, we point out that access to ICTs and information should merely be considered a first step in the process of empowerment and social emancipation. To play a catalytic role in social transformation, ICTs must be integrated into building individuals’ capacity. To achieve this, ICTs should avoid standardizing content and applications, ICTs should tailor applications, and be guided by transformative educational practices. In this sense, tailored ICT applications should: encourage capacity building activities; be inserted in the local context through the development of local information contents; be integrated into pre-existing social structures of the community.

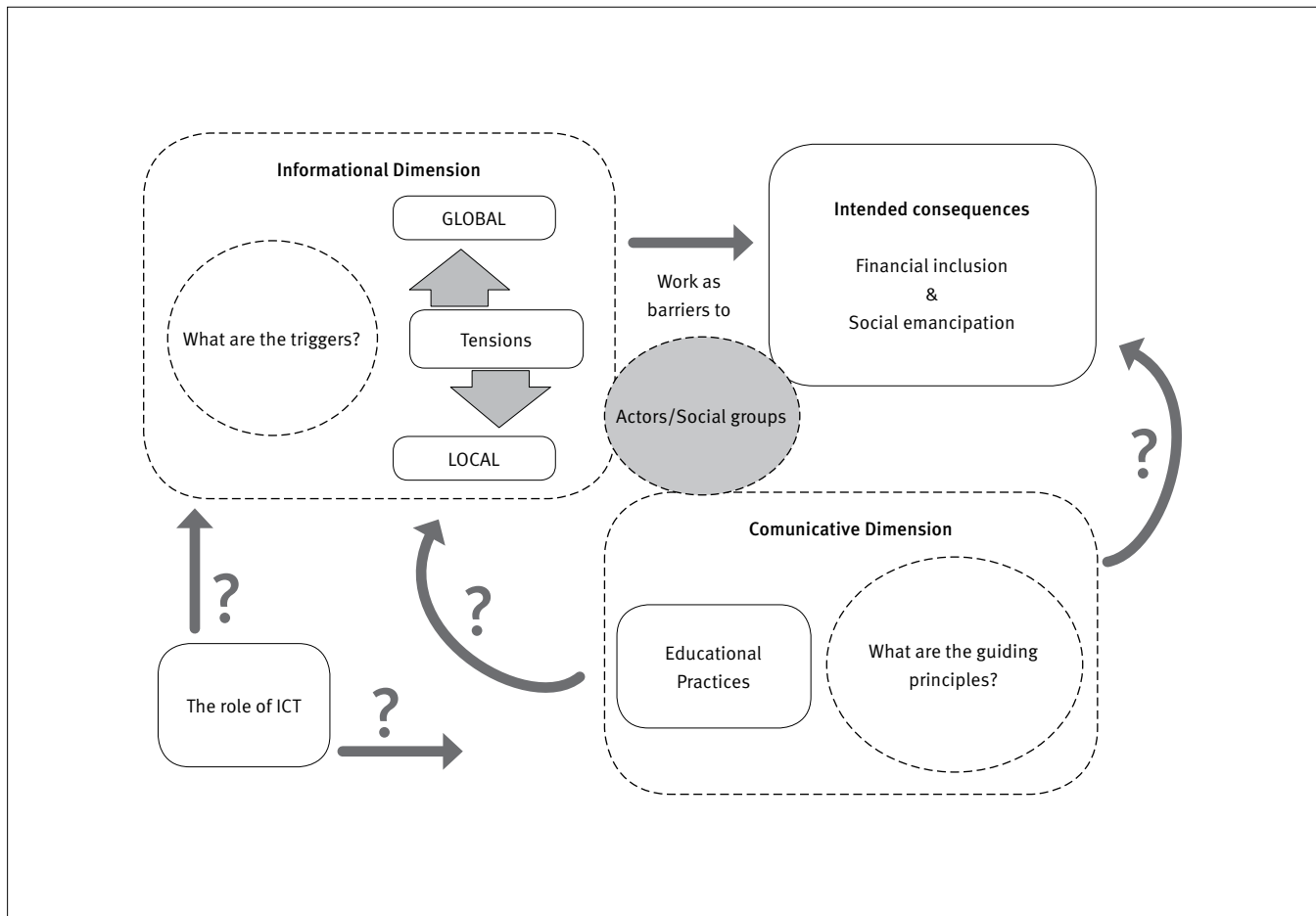
CONCEPTUAL FRAMEWORK

Although the literature reviews revealed several valuable frameworks that could guide our empirical activity, we decided to apply a conceptual framework recently proposed by Birochi (2011) since the framework itself was built as a result of a synthesis of a comprehensive literature review on critical financial education and ICT-mediated education. The conceptual framework encompasses two main dimensions: informational dimension and communicative dimension (Figure 1). The concept of actors/ social groups is central to the framework and it refers to the linkages between individual actors and a set of people who share a common position in their community or society and who are willing to share a set of common assumptions and interests (Pozzebon & Diniz, 2012). The framework shows that often global/ local tensions characterizing the informational dimension in remote territories work as barriers to achieving the intended consequences of microcredit programs, financial inclusion and social emancipation. Likewise, the framework proposes that a communicative dimension might play a role in this process. Finally, the framework places ICTs as an important element, the particular role of which should be elucidated.

The informational dimension highlights tensions between the local and global spheres. These tensions are expressed in different ways and can be caused by different factors (triggers). The framework will help us to identify a set of triggers which generate increased tensions between the local and global spheres. We consider that, if these triggers are identified and understood, they may be no longer obstacles to financial inclusion of low-income micro-entrepreneurs but may actually become opportunities for

transformation. This reasoning is also applicable to broader cross-cultural financial education literature, as global/local tensions or gaps are one way to analyze social phenomena where different contexts or different cultures are involved. At the heart of global/local tensions we find ICT artifacts, as their overwhelming presence, even in remote corners of the world, have been a source of disruption and also non-intended innovations (Castells, 1998). Although the right to information and knowledge is an important entitlement – its absence can contribute to poverty – this notion needs to be balanced against the broader context of existing social and economic inequalities, which may reinforce themselves through technology (Castells, 1997).

Figure 1. Initial conceptual framework



The communicative dimension seeks to identify a set of guiding principles that will guide educational practices involving low-income micro-entrepreneurs. This dimension will grow out of our critical perspective: we see educational practices as a tool for the social emancipation of social actors. To achieve this goal, we propose to investigate the characteristics of low-income micro-entrepreneurs regarding two main aspects: social processes and technological processes. This investigation seeks to understand how the various social restrictions imposed on individuals limit and determine their forms of social interaction. The low-income micro-entrepreneur is affected by social processes,

i.e., the interaction of low-income micro-entrepreneurs among themselves and with other groups, like unions and community associations. As a result of the systematic practice of dialogue, aimed at catalyzing critical reflection on reality, the restrictions and limitations imposed by the dominant ideology are broken.

Actors acquire an expansion of their world views, which exceeds not only the geographic boundaries of the community but the extant framework of established knowledge and notions of truth. The individual and his/her social group begin a process of reviewing established social truths, seeking to identify gaps and fissures in the presumed reality. Besides social processes, the

low-income micro-entrepreneur is also affected by technological processes, where local actors seek to overcome the limitations imposed by the local context to gain access to financial services and/or education by technology means, or simply to gather any other type of information from outside the local context. In this process, it is imperative to undo the image of technology as a neutral and non-ideological instrument so as to permit the emergence of underlying factors which disclose the interests linking the technology to the dominant socioeconomic system. With this in mind, we need to look beyond technology and seek to understand the value of ICTs. In the context of our study, the investigation of these two processes will help us to better adapt the critical financial education framework to low-income micro-entrepreneurs' characteristics.

A review of different approaches to financial education and the use of ICTs corroborate our initial determination to explore and propose a financial education framework tailored to micro-entrepreneurs, using technological artifacts and based on a critical approach. We consider this represents an important gap in the literature, and therefore justifies the research line of inquiry guiding our empirical investigation: what are the guiding principles of an ICT-supported financial education framework that can help to improve financial inclusion and social emancipation, particularly of low-income micro-entrepreneurs? To answer to this research question, we conducted our empirical work in a small community in the Brazilian Amazon, where the introduction of financial access through a banking agents' network has brought about unprecedented socioeconomic changes.

METHODOLOGICAL DESIGN

The investigative approach used in our empirical research is consistent with the paradigm known as critical theory (Guba & Lincoln, 1994): reality is not a given, set concept but, rather, is built based on history by an ideology that concretizes it in necessary, rational and true facts. According to critical theory (Alvesson & Willmott, 2003), reality serves a specific purpose: maintenance and reproduction of the prevailing system, based on various manifestations of power (economic, social and political) and aimed at asserting and legitimizing the supposedly objective and unbiased truth of reality. Critical theory seeks to lay bare the contradictions of the prevailing system by reinterpreting them in light of critical perspectives on historical phenomena (Prasad, 2005).

The epistemological aspects of science are addressed by critical theory from the perspective of the inseparable relationship

between the subject and the object of knowledge, in which the dialogical aspects between them prevail. Such dialogue is dialectic, as it leads to an ongoing process of questioning reality that uncovers contradictions and antagonisms. The process of critical thinking leads individuals to seek and to take action to transform their reality. Therefore, individual knowledge is related to transformation of reality. Through a dialectical movement of thought and action, individuals become aware of their reality and are motivated to overcome the oppressive conditions in which they find themselves (Freire, 1993). Among the various research methods consistent with critical theory, we favor the method of in-depth case study (Stake, 2005).

Selected case: Municipality of Autazes

The selected case refers to the municipality of Autazes situated in the heart of the Amazon forest. Located some 96 kilometers from Manaus, capital of Amazonas State, Autazes can be reached by road in approximately three hours (depending on weather conditions) with an appropriate vehicle or by boat (a twelve-hour journey). The municipality has some 30,000 inhabitants, of whom some 16,000 live in the urban area. The region of Autazes comprises a total of 40 communities and covers approximately 7,600 square kilometers. It is important to note that the 14,000 people who live in the communities outside of the urban area (the largest being Novo Céu, with about 3,000 inhabitants) have no access to financial services close to their homes and often need to travel many hours by boat to downtown Autazes for their banking needs.

Autazes was the first Brazilian municipality in the Northern region to receive a Postal Bank, a correspondent arrangement based on a partnership between the public services provided jointly by the Empresa de Correios, Brazilian postal and mail offices, and Bradesco bank – one of Brazil's largest private banks. The process of banking access began in Autazes in 2002, initially with the introduction of bank correspondents, and eventually with the opening of an actual bank branch. Correspondent banking involves arrangements between banks and non-bank entities – typically retail and services businesses, such as gas stations, post offices, stores and drugstores – where the non-bank entities agree to operate as financial service providers. These retail businesses implement ICT-based point-of-sale devices or basic personal computers functioning as financial transaction terminals. At these terminals, clients can pay their bills, open bank accounts, make deposits and transfers, access credit products, get bank statements and balances, and withdraw government benefits, like *Bolsa Família* (state assistance for families of low income). By July 2009, Autazes

had six businesses offering correspondent banking services and one bank branch.

Banking correspondents faced two common problems with the technological platform, which consists of two devices connecting the terminals (point-of-sale devices) to the bank via the Internet and phone lines. Firstly, correspondents experienced regular difficulties in connecting to the network due to the region's instable telephone and Internet systems. Secondly, high demand on paydays overloads the network, leading to indefinite downtime in the whole system. These technological problems were the main reasons why several users avoided banking transactions at these correspondents.

Microcredit in Autazes is provided by two public organizations: the *Agência de Fomento do Estado do Amazonas* (AFEAM [Agency for the Promotion of the State of Amazonas]), a non-bank financial institution; and the *Programa Nacional de Fortalecimento da Agricultura Familiar* (PRONAF [National Program for Strengthening Family Agriculture]), which is federally supported through the *Ministério do Desenvolvimento Agrário* (Ministry of Agrarian Development) to provide financial support to farmers and their families in both farming and non-farming activities. PRONAF's microcredit allows farmers to expand into new farming and non-farming income-generating activities, as well as acquire machinery, equipment, seeds and inputs.

ICTs in Autazes are present in the public primary and high schools as well as in classes for youth and adult literacy. ICTs are also available through a public telecenter that offers 20 computers connected to the internet, supported by coaches who act as facilitators for the users. The *Centro de Mídias de Educação do Amazonas* (Amazonas Education Media Centre), which manages the distance education program, is an Amazonas State Government initiative to expand and diversify public Amazonas State education through ICTs, using an internet network via satellite.

The city has several training programs for the micro-entrepreneur, programs managed by the federal government, unions and social movements. Among these are: training programs tailored to SEBRAE's rural micro-entrepreneurs; a financial inclusion program called *Projovem Urbano* (Urban Pro-Youth); a literacy program for artisanal fishermen called *Pescando Letras* (Fishing Letters); the national educational program related to agrarian reform called *Programa Nacional de Educação na Reforma Agrária* (PRONERA); and the *Jovem Saber* (Youth Knowledge) program, offered by the *Confederação Nacional dos Trabalhadores na Agricultura* (CONTAG [National Confederation of Agriculture Workers]), a distance learning program for young rural workers, with a focus on professional training and union politics. Of these programs, the last two - PRONERA and Jovem Saber –

most closely relate to the pedagogical principles of Freire, since they are oriented towards empowerment and social emancipation. Despite this, none of the city's programs include content related to financial education. Although PRONERA and *Jovem Saber* integrate critical and emancipatory approaches, neither provides financial training for micro-entrepreneurs.

The choice of Autazes as a case study was based on the municipality's unique features, which help in understanding the phenomenon under study. Beyond sharing numerous characteristics with hundreds of typical Brazilian municipalities – such as a high level of agricultural and commercial activity – it enjoys growing access to financial services and is located within a very particular geographical context: an isolated town, surrounded by rivers, in the Amazon rainforest. To some extent, this geographical context allows us to isolate certain socioeconomic phenomena, and, thus, better understand their impact on the perceptions of the social actors interviewed.

Data collection

Data were collected in two periods – December 2009 and June 2010 – using semi-structured interviews and field notes based on non-participant observation, including records of observations, informal discussions and conversations. Information from secondary sources was also collected, such as documents, newspapers, magazines and websites.

The interviews of low-income micro-entrepreneurs and the population were conducted by a single interviewer and lasted, on average, 30 minutes. We employed the concept of a social group to organize our interviewees. Despite the focus on low-income micro-entrepreneurs as our main social group, we tried to enrich the collection and analysis of data with respondents from three other social groups that we consider relevant to the process of financial education: local teachers, members of labor unions and public managers. Selection of these three extra social groups was based on the following criteria: (1) local teachers who are responsible for working with educational programs, either face-to-face or distance education; (2) members of labor unions who represent the interests of the local workers and are also responsible for some educational programs for rural workers; (3) public managers who are responsible for the implementation and management of local public policies oriented towards low-income micro-entrepreneurs, including microcredit programs and municipal policies for socio-economic support. Thirty-two individuals from four different social groups were interviewed, according to their respective characteristics and the selection criteria shown in Exhibit 3.

Exhibit 3. Respondents by social groups

Social group	Respondents	Characteristics	Selection criteria
Low-income micro-entrepreneurs	13	Producers, traders and rural and urban service providers	Owners of small businesses or economic activities, with no employees
Teachers	9	Teachers and coordinators of public and distance learning courses for youngsters and adults	Experience teaching youngsters and adult low-income micro-entrepreneurs in classroom or distance learning
Unions	4	Officers and employees of unions, associations or cooperatives of rural and urban workers	Union representatives, representatives of associations and/or cooperatives of workers
Public managers	6	Municipal civil servants, state and federal education programs for low-income micro-entrepreneurs; microcredit program managers	Government officials working directly with programs targeted to low-income micro-entrepreneurs

Data analysis

Data analysis followed the basic coding techniques proposed by Miles and Huberman (1994). These analytical techniques were steered by concepts in the conceptual framework on which the encoding process was based. The information obtained through audio recordings during the interviews was fully transcribed and coded using NVivo. To ensure respondents' anonymity, all names have been changed.

We followed a deductive-inductive analytical strategy, where the conceptual framework worked as a sensitizing guide to the empirical investigation. The data collection was guided by the concepts and dimensions as proposed by the framework (the deductive part). At the same time we allowed for deviances, inconsistencies and new elements which might emerge inductively from the analysis. Pre-existent themes (codes, labels) – inspired by the conceptual framework – as well as the emergent themes – those inspired by the empirical data – were subject to iterative techniques – de-contextualization, aggregation, reconceptualization, as suggested by Miles and Huberman (1994), leading to the development of a refined conceptual framework.

Prior to the coding process, Excel worksheets were created to join all the data collected from the interviews, with information such as the respondent's profile, their role or position (e.g., driver, teacher, street vendor), address, duration of the interviews, among others. We enriched the database with the transcribed field notes from observation and with secondary data, such as

documents and web sites. The interviews were compared in both within- and cross-group mode from the relevant social groups. In an initial phase, we codified and compared data from interviewees taken from the same relevant social group (for instance, micro-entrepreneurs). The functionalities *Tree Nodes* and *Case Nodes* of NVivo provided support for this procedure. A hundred and forty codes were generated in this first phase. In the second phase we compared data from different relevant social-groups – several codes were eliminated, others aggregated, others added – consolidating a small number of codes, according to the concepts and dimensions provided by the conceptual framework and also according to emergent concepts. The iterative analysis of the empirical data allowed the revision of the conceptual framework, the refinement and adjustments of the concepts and led to interesting insights.

A concrete example of the interconnection between pre-existing and emergent codes can be provided using the label trigger. In the initial conceptual model, we have the concept of trigger, that was initially an empty category, i.e., we created the node trigger in the NVivo, a free node without sub-categories. During the analysis the concept of a trigger worked as a guide to identify specific triggers in our data. Despite a number of triggers emerging during analysis, only two resisted until the end of the analytical process and consequently were incorporated in the final conceptual framework. This occurred due to these two triggers emerging as relevant and meaningful in a number of interviews, as can be observed in the Exhibit 4.

Exhibit 4. Triggers: Chain of evidence among open codes, selective codes and categories from empirical field

Dimension	Category (Triggers)	Selective Codes	Open Codes
Informational dimension: Local vs. global tensions	Lack of financial education and training programs for low-income micro-entrepreneurs	Indebtedness	Raising of payroll loan (a loan for which the payments are deducted directly from the client's pay check) specially among retired individuals
		Bureaucracy (officialism)	Difficulty of getting access to credit for productive activities, since the beneficiaries could not provide the required collateral guarantees and the official documentation proving their capacity to pay back the loan
	Lack of contextualized information	Lack of adequate credit policies	Private financial agents seek to expand their credit portfolio at low risk; abundant offer of additional financial resources for a population which historically had difficult access to credit; inadequate financial information structure for population
	Lack of financial information	Lack of financial information	Lack of operational knowledge (instrumental knowledge); lack of knowledge regarding the financial system's norms and rules)
	Lack of contextualized information	Lack of contextualized information	Lack of synchronization between characteristics of the educational current programs and local needs of students

The same occurred with the guiding principles, as can be observed in the Exhibit 5.

Exhibit 5. Guiding principles: Chain of evidence among open codes, selective codes and categories from literature review

Dimension	Category (Guiding principles)	Selective codes	Open codes	
Communicative dimension: Transformative educational practices	Dialogue and debate	Dialogue and debate	Simulated negotiations between peers and by understanding the role played by various actors in the social system	
		Critical thinking	Undo the dominant ideology; individuals and their social groups begin a process of reviewing established social truths, seeking to identify the gaps and fissures in the hegemonic discourse	
	Meaningful learning	Meaningful learning	Local context that shapes individual's worldview; strength community bonds and ties	
	Social practices	Social practices	Constant process of critical reflection (action/reflection/action); act on the world to transform the reality	
	Social practices	Empowerment	Empowerment	Enhancing the capacity of poor people to influence the state institutions that affect their lives, by strengthening their participation in political processes and local decision making
		Problem-posing	Problem-posing	Problem-posing attitude regarding various aspects that make up the dominant ideology; undo the impression that the world rests on immutable facts; emphasize the historicity of institutions and economic and social power, tensions and divergent interests among social groups; social action by social mediators (associations, unions, cooperatives)
		Political action	Political action	The political action is an action through which actors seek to facilitate the formalization of their interests vis-à-vis public institutions and channels for their participation therein. It is an exercise in citizenship that aims to meet the objectives of the social group in the search for a rebalancing of prevailing power asymmetries

In order to better illustrate the coding process that allowed us to achieve our results, we added Exhibits 4 and 5 to further illustrate the chain of evidences, in addition to Exhibits 6 and 7 that are integrated in the presentation of the results,.

RESULTS

In this section, following a brief description of the socioeconomic changes that occurred in the municipality of Autazes as a result of expanded local access to financial services, we shall present our analysis and discuss the results pertaining to the informational and communicative dimensions, as defined in the conceptual framework.

Context: Access to financial services in Autazes

Following the implementation of the first banking agents, the economic boost brought about by access to financial services has significantly transformed the economic conditions in Autazes. The local population began to perform financial transactions in

local retail establishments, no longer needing to travel to the capital as they did before the start of banking agents operations. All economic sectors have since grown significantly. The access to financial services enabled by banking agents also introduced new technological products, such as electronic banking cards, previously unknown to most of the local population. Hence, Autazes, which until 2002 had been relatively isolated from the main facets of economic progress, was exposed in a brief period to abundant bank credit and other modalities of financial services. In short, the municipality faced a brand new reality without the information necessary to assist people in handling and understanding new processes and resources.

Informational dimension: Local vs. global tensions

During the empirical investigation process, two triggers were identified in the use of ICT artifacts for low-income micro-entrepreneurs to access financial services: the lack of financial education and training programs for low-income micro-entrepreneurs and the lack of contextualized information. Exhibit 6 presents example quotations that illustrate the importance of those triggers.

Exhibit 6. Quotations that corroborate the analysis of the informational dimension

Triggers	Quotations
Lack of financial education and training programs for low-income micro-entrepreneurs	"...we are aware that people should have more access to information about credit. That's why I think we need, in addition to a course focused on the use of credit cards...also aimed at educating about credit itself." [Baker]
Lack of contextualized information	"... The kind of local education that is given is not discussed with local civil society... all contents came defined top down..." [Local coordinator of Jovem Saber program]

Lack of financial education and training programs for low-income micro-entrepreneurs: Several low-income micro-entrepreneurs mentioned a need for financial training in the use of electronic cards in connection with their businesses. Even the most elementary forms of access to financial resources require minimum instrumental knowledge to enable users to operate the technological artifact – i.e. users, in general, must be able to perform simple operations, such as entering their passwords. Functionally illiterate individuals, such as many artisanal fishermen of Autazes, struggle to perform this type of basic operation.

The lack of contextualized financial education programs in support of microfinance initiatives creates tensions between the local and global spheres. These tensions promote increased social exclusion of low-income communities, marked by insolvency legal proceedings and culminating in negative credit records.

In this context, the high rate of indebtedness among the low-income population is evidence of one of the perverse side effects of Autazes' recent socioeconomic development. Therefore, financial education has an important role to play in relieving socioeconomic tensions. Moreover, it must be part of a broader program, supported by public policies, to enable individuals to achieve social emancipation.

Tailored ICT applications could play a role in facilitating social change, if conceived as part of the training and mobilization of social groups. Access to ICTs as a channel for accessing financial services is a pre-condition – not a guarantee – for financial inclusion. This is evidenced by income transfer programs through electronic payments such as *Bolsa Família* in Brazil or others conducted in Andhra Pradesh, India. In those cases, the need to use smart cards or mobile phones by the poorest segment of the population did not represent a barrier (Parker, 2013). Nevertheless,

the capability to use technological devices is no guarantee of empowerment. Many of these models might leave customers unaware of potential connections to other financial services that could make their lives easier, or unaware of alternatives.

Our analysis suggests that tailored ICT applications have the potential to enable local needs of low-income micro-entrepreneurs to be met. These applications might enable micro-entrepreneurs to form local networks in concert with programs of local productive development and other governmental initiatives. Those local networks should favor information and knowledge exchange – both local and non-local – through functionalities that allow dialogue and debate within and across those social groups. The ultimate goal is the development of a critical awareness of the role of entrepreneurship in local development. We did not encounter these conditions in Autazes, but grasped from our interviews that people are conscious of its need.

Lack of contextualized information: teachers working in a specific governmental educational program for young adults emphasize the lack of synchronization between characteristics of the current program and local needs of students. For example, the federal government, which is responsible for the program, decided to promote technical sawmill expertise, though this activity rarely occurs in the Amazonian context. In this case, it would be reasonable to expect such specialization to be somehow correlated with forestry products and their respective context. Emphasis on local characteristics is essential to the success of any financial education program: i.e., taking account of and meeting the demands of the local community.

We argue that highly standardized ICT applications work as barriers to empowerment and social transformation. The lack of fit of ICTs to the contextual characteristics that shape local micro-entrepreneurs – with their specific needs and interests – open spaces for uses of ICT that might potentially result in social exclusion and inequalities. In Autazes, we found a number of examples where microfinance initiatives using highly standardized ICT applications – like point of sales (POS) and smart cards – are parts of financial access programs which add no contextual information neither through those channels nor additional ones. Local interests and needs are not taken into consideration. Social groups formed by local micro-entrepreneurs, worker unions, local associations and cooperatives, are not listened to. These groups are unable to contribute to the building of those programs. Two concrete examples are the local public telecenter and existing ICT-based educational programs such as the Centro de Mídias de Educação do Amazonas. Both offer an excellent technological infrastructure supported by technical experts, but each are standardized and not connected to any

strategy of social or financial inclusion oriented towards micro-entrepreneurs.

Furthermore, signs of increased social exclusion are detectable by the characteristics of access to the resources available – i.e., access to financial assets for businesses and access to and use of technological resources. Tensions between the local and global spheres are revealed when individuals attempt to access such resources, and at this point, the need for financial education initiatives to overcome multiple tensions arises. Information asymmetries between players and the near absence of financial education programs integrated with available financial services are further factors in such tensions. Educational alternatives addressing issues beyond simple instrumental notions regarding the use of bank cards may also be part of the means of rising to these challenges. In this context, broad dissemination of information about the public resources available to citizens should be part of an action plan aimed at empowering local low-income micro-entrepreneurs. However, results will only be effective if the local context is taken into account in the process of designing a financial education program.

Communicative dimension: Transformative educational practices

From analysis of our interviews we recognized that from the many principles identified in literature four elements seem crucial to enable a financial education program to promote local development and social emancipation. Absence of these guiding principles prevents the program from achieving positive results. In Autazes we noticed their absence or, in some cases, we detected their presence in embryonic or non-purposeful form, i.e. simply as instrumental knowledge, as in the case of SEBRAE's programs. These programs are not articulated or managed in a way which might promote positive outcomes. The four guiding principles are: dialogue and debate, critical thinking, meaningful learning and social practices (action/reflection/action). It is no coincidence that all of those elements adhere to a transformative approach to financial education. Exhibit 7 presents examples of quotations that illustrate the importance of those four elements.

It is important to stress that these four guiding principles are intimately connected. They reinforce and feed each other. We identified strong evidence in Autazes of communications between low-income micro-entrepreneurs and other local social groups, such as associations and cooperatives of producers and labor unions. Micro-entrepreneurs usually seek alternative solutions to solve their business issues (credit access, dealing with information asymmetries and solving their financial indebtedness). These micro-entrepreneurs are supported by associations or unions,

which provide a good forum for dialogue and to debate their claims. We argue that such practices - dialogue and debate - are seminal social mechanisms which can act as a balance between individual needs and the interests of the social group to which the individual belongs. Dialogue and debate is a practice actors use to shape their own critical views of reality. They do this to undo the dominant ideology through the continuous exercise of critical reflection shared within the social group. Dialogue can be practiced through debate, from simulated negotiations between peers and by understanding the role played by various actors in the social system, as well as other educational activities.

Exhibit 7. Quotations that corroborate the analysis of the communicative dimension

Guiding principles	Quotations
Dialogue and debate practices	"... they were ... people like that ... They did not know what they should demand ... They did not know their rights ... Today they are questioning..." [Local teacher]
Critical thinking practices	"There are no institutional instruments for the individual to acquire his own conscience. I call this 'conscious education'. You are missing a conscious education that enables citizen participation so that it can exercise their social rights in full." [Union of rural workers]
Meaningful learning practices	"... and they're geared to do just that: work with the site, using, for example, in mathematics, quantities of manioc, quantities of pulp, etc. ..." [Local teacher]
Social practices (Action/reflection/action)	"... the Projovem – Saberes da Terra (Knowledge of the Earth) [Educational program targeted to the agricultural worker] is no longer limited to the classroom, but also to practice: learning by exercising agriculture" [Union of rural workers] "School has a sort of connection with the community. Here, we have technological education, which facilitates the connection of the local community with the world through the Internet... They are also organizing themselves. The ways that they will get the financial resources to make the community grow. So this is a bond of union. Mainly the parents-teachers association, to improve the unity of the people in search of a better education ... Everything is now revolving around the cooperatives, the exchange of knowledge: fish farming cooperative, agricultural cooperative, milk cooperative, etc." [rural school teacher – distance learning education]

Despite this willingness for dialogue and debate between low-income micro-entrepreneurs, there are no social mechanisms to foster critical thinking of reality. We refer to educational and social mechanisms that promote dialogue as a practice by which actors build their own critical views of reality, through continuous exercise of critical reflection shared with the social group. Critical thinking is a practice that seeks to offer micro-entrepreneurs the opportunity to reflect critically on their own economic and social status vis-à-vis the dominant ideology in the practices of banking correspondents of Autazes when dealing with microfinance. How this disconnect is perceived provides an opportunity to undo the prevailing view.

Moreover, when local micro-entrepreneurs recognize local references from the content under discussion related to their daily lives, there is a deep sense of belonging to the learning process, which strengthens educational linkages and helps overcome constraints and barriers. Educational practice which brings non-local educational programs to a local community and transforms content into something meaningful in the local context is called meaningful learning. This strengthens community bonds and ties to education, which becomes the actors' ally in their learning

process. Several teaching strategies are used, such as tailored games.

Various dynamics and actions can be implemented for microfinance education, based on local reality, such as: the creation of units of measurements related to Amazonian fruits or other local produce; maps with reference places and to local activities; setting up local newspapers; and campaigns for newspapers to adopt the local language. SEBRAE employs such dynamics and creates games based on the examples above, these dynamics and games being appropriate to the local context.

In such a scenario, social practices occur as a constant process of critical reflection (action, reflection, action), which leads the individual to act on the world. This combination of action and reflection is what Freire refers to as social practice or praxis: reflecting and acting upon the world in order to transform it (Freire, 1993). Social practices constitute a constant exercise of citizenship, as we perceived, albeit in incipient form, among students of the Projovem Urbano program.

In this scenario, social practices take place as a constant process of critical reflection (action/reflection/action), leading the individual to act on the world. It is this combination of action and

reflection that Freire called social practice or *praxis*: reflection and action upon the world in order to transform it (Freire, 1993). Social practices thus manifests as a constant exercise of citizenship, as we perceived, in an incipient way, among students of Projovem Urbano education program.

During this process of critical reflection and action, the awareness that public resources belong to the local community is acquired, which constitutes an important step towards empowerment. Local and non-local resources such as technological artifacts, ICT infrastructures, public funds for micro-entrepreneurs and public education programs, take on a new meaning for each one in the community. However, empowerment practices in Autazes are scattered and disjointed in education programs for low-income micro-entrepreneurs, without any dialogue among them, such as, for example, Projovem – Saberes da Terra, PRONERA and Jovem Saber programs. In this perspective, the notion of empowerment as choice and control of ones' own life is still far from being fully realized in Autazes. According to the World Bank (2000, p. 39) “empowerment means enhancing the capacity of poor people to influence the state institutions that affect their lives, by strengthening their participation in political processes and local decision making. And it means removing the barriers - political, legal, and socio-cultural - that work against particular groups, and building the assets of poor people to enable them to engage effectively in markets”.

In parallel with this, many public programs and initiatives were also identified, as previously presented, that foster financial inclusion, such as: digital inclusion programs; educational programs for capacity building of low-income micro-entrepreneurs; government programs for the promotion of local socioeconomic development; distance education programs to youth and adults; and educational programs offered by unions and associations. Despite the diversity of offerings, programs do not have articulation between them, resulting in isolated actions, which overlap or do not meet the specific needs of low-income micro-entrepreneurs. Moreover, none of these programs consider, at least, two seminal elements for the processes of financial inclusion of low-income micro-entrepreneurs: financial education principles and critical use of technological artifacts. In other words, given that the low-income micro-entrepreneurs make frequent use of ICT artifacts to carry out their microfinance transactions, and that financial education is needed to support them in their business, it becomes central to implement financial education programs targeted at this profile, which makes use of ICT artifacts. In this sense, an ICT-supported financial education program tailored from a critical perspective should act as a transversal axis between the above-mentioned initiatives, aimed at appropriation of the use of available resources, as well as the

socioeconomic transformation. In this precise sense, the critical approach should act as a critical instrument to the dominant system, to guide the two previous elements towards the social emancipation of the low-income micro-entrepreneurs.

DISCUSSION AND IMPLICATIONS FOR FINANCIAL EDUCATION

A critical financial education program must take account of the profile and socioeconomic conditions of low-income micro-entrepreneurs before addressing solutions aimed at developing specific local skills. In tailoring programs to local low-income micro-entrepreneurs, the first step must be a clear outline of the local context, as represented in its historical, social and economic aspects. Nevertheless, unless such financial education strategies are capable of engendering tangible and concrete economic practices related to activities carried out by locals, they will not suffice. These initiatives must simultaneously take account of both the local and the individual context, in order to understand characteristics, habits and customs. Hence, critical financial education programs must connect educational processes to individuals' way of life, recognizing the singularities of their needs and circumstances, as expressed by economic and subsistence activities (Kempson & Collard, 2012). Relationships between individuals and other social groups, as well as those within their own social group, promote or constrain their actions in ways that may also shed light on additional elements involved in this process.

Meaningful learning is also considered a central aspect of Freire's critical pedagogy (1993). Accordingly, training programs provided by global providers or any actor outside the local context should strive to understand the specificities of low-income micro-entrepreneurs so as to present more contextualized solutions (language, examples and dynamics). Understanding current habits and practices concerning educational process, local financial services (Burkett & Sheehan, 2009; Cabraal, 2011), the ICTs available (Gigler, 2006) and the social mediation processes performed by groups during their social interactions, are important factors for successful achievement of these goals.

In this process, instrumental knowledge of financial management is a relevant component in enabling low-income micro-entrepreneurs to escape from the financial exclusion and socioeconomic exploitation to which they are currently subjected. Increased awareness of consumer protection laws, as well as of the risks involved and ways to prevent them is an initial step of paramount importance, as underscored by instrumental education programs. However, instrumental knowledge is not sufficient. Training programs should not be restricted to instrumental

approaches, as if these alone could foster one's empowerment as a social player. Transformative approaches, such as the REFLECT method (Sempere, 2009), aimed at strengthening individual capabilities (Cabraal, 2011) through community empowerment practices may foster alternatives geared towards social emancipation (Sen, 1999; Freire, 1993).

According to Sen's (1999) perspective on human development, improvement is closely linked with overcoming factors that restrain individual freedom as well as group autonomy. Enhancing local players' capabilities and increasing their possibilities – such as increasing their access to various resources – may represent important human development milestones in the perspective of local players. In this context, access to information, particularly to financial education programs, may greatly increase possibilities for local players, which will positively affect their individual capabilities.

However, one must be cautious when referring to financial education programs as an alternative to improving individual skills. Education should not be regarded a panacea able to overcome all individual limitations on access to knowledge and, consequently, to human development. It must also not be viewed as a neutral and non-ideological instrument (Freire, 1993). Financial education geared towards human development should create empowerment opportunities for players seeking social emancipation. Empowerment in the educational process is related to the appropriation of resources and processes for social transformation endeavors undertaken by the actors. Strengthened expropriation, of resources addresses the historically conditioned social imagination that shapes the social biography of poor individuals. Reversal of restrictions on access to resources is forced by acts of repossession and empowerment. Beyond appropriation of any material resource, this practice seeks to encourage the formation of a proactive approach to finding ways and resources that can function as enablers of social emancipation, as proposed in a number of critical education programs. Acquiring an empowered consciousness of public resources – including school, technological artifacts, learning processes and supporting human resources – is an important step in facilitating transformation.

In this context, an ICT-supported financial education program tailored from a critical perspective should not be restricted to training individuals in merely instrumental aspects, such as learning how to operate devices and products used to access financial resources, or even to training in small business management and entrepreneurship, as is observed in the programs of certain public institutions in the state of Amazonas. On the one hand, instrumental knowledge is important as a possible first step in acquiring basic operating notions of management,

technology and finance. On the other hand, an ICT-supported financial education program tailored from a critical perspective should not be restricted to these goals. There are many examples of instrumental programs in financial education literature. Such instrumental programs have at least two limitations: they often rest on performance-based concepts, and they do not address the core issue of social exclusion.

Therefore, it is essential to envisage not only isolated financial training in classrooms, but a comprehensive action plan to enable appropriation of means and resources by local social players (empowerment process). Gigler (2006, 2015) presents a few lessons learned from the use of ICTs aimed at empowering poor communities, such as local contextualization and integration of education programs into pre-existing economic and social development programs.

As previously mentioned in the case of Autazes, few ICT-supported programs with good infrastructure were identified. Good examples included the public telecenter and Centro de Mídias de Educação do Amazonas. Also, several initiatives and programs for low-income micro-entrepreneurs, such as AFEAM, PRONAF, and SEBRAE's education program, as well as a variety of training programs sponsored by unions and workers' associations were identified. A critical financial education program could make a significant contribution to social inclusion of low-income micro-entrepreneurs in almost all of these initiatives.

However, the lack of coordination between these initiatives and programs and uncritical use of such contents (instrumental approaches), are gaps to be overcome. Our analysis also suggests that these initiatives have a great transformative potential, if they are designed as digital networks for low-income micro-entrepreneurs – local and non-local – and supported by ICT-supported tailored applications, such as the web portal sponsored by FBB, a portal based on social media technologies.

Hence, tensions between local and global spheres must be viewed socially as opportunities for transformation. In other words, structural disadvantages represented by these tensions, may be viewed socially as the ideal context for social transformation. Incorporation of tensions as structural properties of the social system is embodied in a critical financial education program focused on training of players who use microfinance services in their businesses and other activities. Thus, a critical financial education program enables stakeholders to challenge the prevailing social order. In this transformation process, social empowerment figures as a major driver of change in the historical and social conditions of underprivileged people.

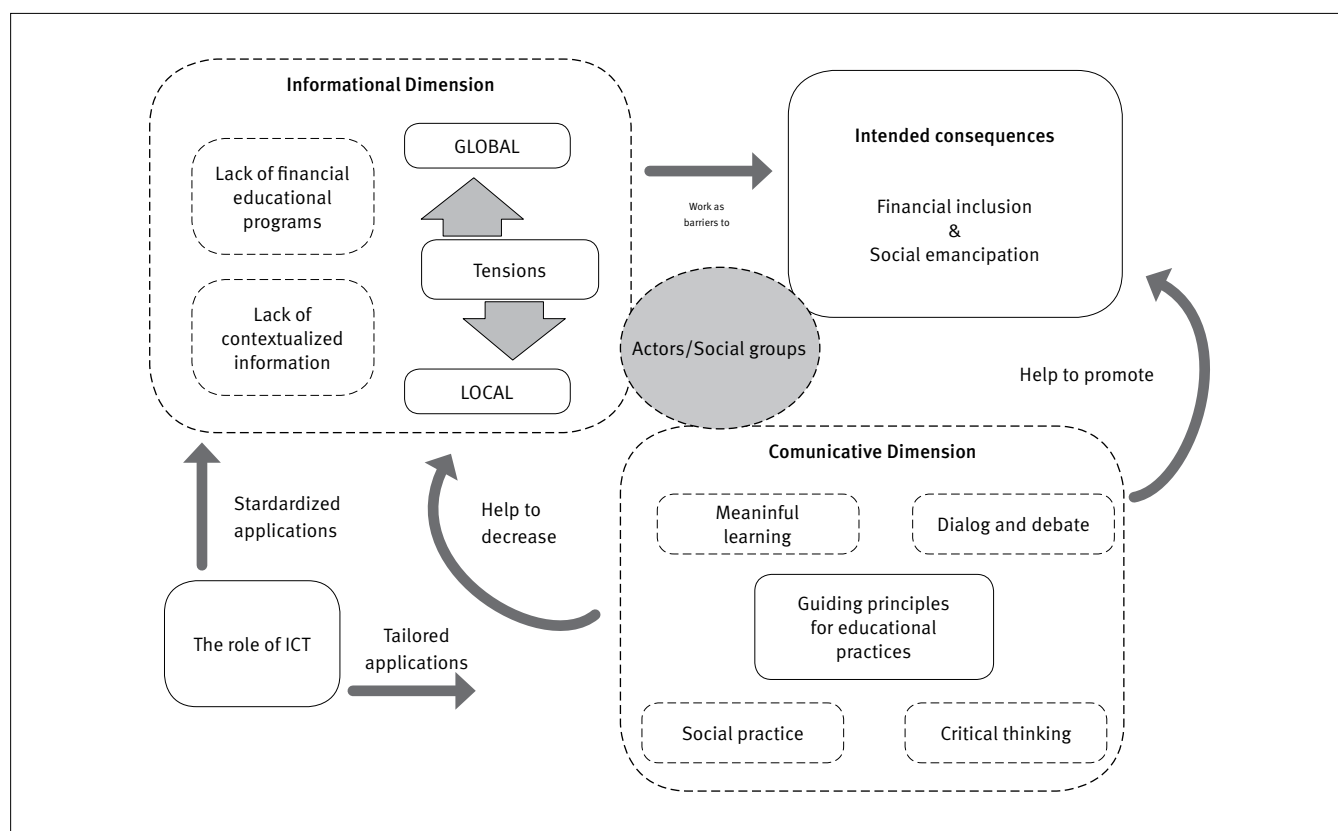
In the process, it is essential that activities that contextualize the content of financial education initiatives be conducted in order to make them meaningful for the actors. In

addition, ICT-supported financial education programs tailored from a critical perspective must be oriented towards the social practice of low-income micro-entrepreneurs, as this is their main perceived demand. That is, the relationship between economic activity and knowledge acquired must be constantly present to highlight the desired purposes. Similarly, fostering resource-related empowerment must be an integral part of a social practice-oriented community. The social practice should emerge as the result of a critical educational process in which the combination of critical reflection and action enables social actors to achieve critical awareness of the conditions that oppress them. As a result, they act on the world with a view

to transforming reality. This process is balanced between the interests of the individual and those of the social group. The individual realizes that his/her critical thinking about the world will have effect only if it is articulated as an act of transformation which is also established for participatory practices within the social group. In this sense, the school represents the first instance of a link between critical knowledge and mobilization of social practices.

From this perspective, the present discussion allows us to propose a set of guiding principles that might be part of a critical financial education framework as showed below (Figure 2).

Figure 2. Final conceptual framework



None of these practices is anything new in the field of education, especially of critical education. The principles espoused by Freire have long been discussed among educators. However, when these principles are reorganized through practices aimed at supporting a financial education program aimed at low-income micro-entrepreneurs who use microfinance services through technological mediation, a new, unprecedented set of conditions and characteristics arises presenting observational challenges for empirical research. Empirical data revealing opportunities for

transforming the lives of communities and stakeholders may be approached through critical financial education. Rahman (2006), Sama and Casselman (2013) cite the use of community learning centers based on ICTs as an example of real alternative processing. For example, the fledgling use of ICT telecenters by low-income micro-entrepreneurs may represent a significant expansion of their individual capabilities. Similarly, distance learning classes, offered in the municipality by the state government, also represent unexplored opportunities which may bring significant results in the future.

CONCLUSION

Providing financial education programs is a means of bridging an important gap, reflected in the almost complete absence of initiatives targeted to low-income micro-entrepreneurs in the state of Amazonas. The lack of such projects fosters increased indebtedness resulting from inappropriate use of resources, and aggravates or perpetuates social exclusion. As an intermediary solution, financial education programs based on instrumental knowledge can help low-income entrepreneurs, but only as a first step.

The gaps identified in the literature, such as the lack of financial education programs for low-income micro-entrepreneurs, who use ICTs in their businesses, was also confirmed by the findings of the empirical field. In this sense, an ICT-supported and tailored critical financial education framework for low-income micro-entrepreneurs may result in relevant theoretical and practical contributions regarding financial inclusion. A critical financial education program, specifically targeted to social emancipation of low-income micro-entrepreneurs, who use technology-mediated resources, may yield additional benefits for the few current financial education initiatives conducted by government institutions in the state of Amazonas.

Access expansion through virtual communication channels, such as digital networks, may allow low-income micro-entrepreneurs increase their availability, via virtual interactions, enabling the actors to integrate more efficiently into society and into the market. The permanence of social groups in their respective territories discourages movement and migration, thereby reinforcing social bonds and community ties, and fosters development of local production by integrating financial management into routine production activities. Moreover, it allows improvement of individual capabilities, further promoting social transformation through appropriation of resources and serving as a driver of social emancipation among local actors. In this context, social mediators – such as associations, unions and cooperatives – play an essential role, promoting individual and collective interests emerging within the local community.

This article presents the results of an empirical research that examined how critical financial education could be a driver of financial inclusion of impoverished low-income micro-entrepreneurs, who use ICT mediation in their businesses in Autazes, in the state of Amazonas. Its main results may provide policymakers and academic researchers with topics related to financial education and financial inclusion. Despite the particularity of the case presented, several aspects potentially related to numerous southern hemisphere countries have been discussed.

The theoretical contribution of this article is to offer an innovative framework which creates communication channels between different fields of knowledge in order to deliberate on and propose ICT-supported financial education tailored from a critical perspective for low-income micro-entrepreneurs. Results of the data analysis enriched the initial conceptual framework by identifying two factors causing local/global tensions - lack of training programs and lack of contextualized information - and four guiding principles: dialogue and debate, critical thinking, meaningful learning and social practice.

In spite of these results, particularly the distinction between instrumental and critical approaches in the field of financial education, further research is needed on how to validate and deepen the implementation of this critical financial education framework.

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REFERENCES

- Adeya, N. C. (2002). *ICTs and poverty: A literature review*. Ottawa: International Development Research Centre (IDRC).
- Alvesson, M., & Willmott, H. (2003). *Studying management critically*. London, UK: Sage Publications.
- Augsburg, B., & Fouillet, C. (2010). Profit empowerment: The microfinance institution's mission drift. *Perspectives on Global Development and Technology*, 9(3-4), 323-351. doi:10.1163/156914910x499732
- Avgerou, C. (2008). *Information systems in developing countries: A critical research review*. Basingstoke, UK: Palgrave Macmillan.

- Best, M. L., & Kumar, R. (2008). Sustainability failures of rural telecenters: Challenges from the Sustainable Access in Rural India (SARI) Project. *Information Technologies and International Development*, 4(4), 31-45.
- Birochi, R. (2011). *Uma abordagem crítica para a educação a distância orientada para as microfinanças* (Doctoral thesis). Fundação Getúlio Vargas, São Paulo, SP, Brazil.
- Burkett, I. (2003). *Microfinance in Australia: Current realities and future possibilities*. Brisbane, AU: University of Queensland.
- Burkett, I., K., & Sheehan, G. (2009). *From the margins to the mainstream: The challenges for microfinance in Australia*. Brotherhood of St Laurence and Foresters Community Finance. Fitzroy, Victoria, Austrália.
- Cabraal, A. (2011). *The impact of microfinance on the capabilities of participants* (PhD Thesis). School of Economics, Finance and Marketing, RMIT University. Melbourne, Austrália.
- Castells, M. (1997). *The power of identity: The information age: Economy, society, and culture* (Vol. 2). Oxford, UK: Blackwell Publishers.
- Castells, M. (1998). *End of millennium: The information age: Economy, society, and culture* (Vol. 3). Oxford, UK: Blackwell Publishers.
- Cecchini, S., & Raina, M. (2004). Electronic government and the rural poor: The case of Gyandoot. *Information Technologies and International Development*, 2(2), 65-75.
- Consultative Group to Assist the Poor. (2005). *Protection des emprunteurs dans le secteur de la microfinance*. Retrieved from www.cgap.org
- Cole, S., Sampson, T., & Zia, B. (2009). *Valuing financial literacy training*. World Bank. Washington, D.C, USA.
- Diniz, E. H., Birochi, R., & Pozzebon, M. (2012). Triggers and barriers to financial inclusion: The use of ICT-based branchless banking in an Amazon county. *Electronic Commerce Research and Applications*, 11(5), 484-494. doi:10.1016/j.elerap.2011.07.006
- Diniz, E. H., Cernev, A. K., Gonzalez, L., & Albuquerque, J. P. (2013). Mobile payments in Brazil: How to make them happen? *The European Financial Review*. Retrieved from <http://www.europeanfinancialreview.com/>
- Faz, X., & Moser, T. (2013). *Advancing financial inclusion through use of market archetypes*. CGAP, Focus Note 86/2013. Retrieved from <https://www.cgap.org/sites/default/files/Focus-Note-Advancing-Financial-Inclusion-through-Use-of-Market-Archetypes-April-2013.pdf>
- Fernando, J. (2006). Microcredit and empowerment of women: Visibility without power. In: J. Fernando (Ed.). *Microfinance perils and prospects* (pp. 187-237). New York, USA: Routledge.
- Fouillet, C., Guérin, I., Morvant-Roux, S., Roesch, M., & Servet, J-M. (2007). Le microcrédit au péril du néolibéralisme et de marchands d'illusions: Manifeste pour une inclusion financière socialement responsable. *Revue du Mauss*, 29(1), 248-268.
- Freire, P. (1993). *Pedagogy of the oppressed*. New York, NY: Continuum.
- Gigler, B. (2006). *Enacting and interpreting technology: From usage to well-bring: Experience of indigenous peoples with ICTs*. In: H. Rahman (Ed.). *Empowering marginal communities with information networking* (pp. 124-164). London, UK: Idea Group Publishing.
- Gigler, B. (2015). *Development as freedom in a digital age: Experiences of the rural poor in Bolivia*. Washington: The World Bank.
- Gigler, B., & Bailor, S. (2014). *Closing the feedback loop: Can technology bridge the accountability gap?*. Washington: The World Bank.
- Guba, E. G., & Lincoln, Y. S. (1994). *Competing paradigms in qualitative research*. In: N. Denzin, & Y. Lincoln (Eds.). *Handbook of qualitative research* (pp. 105-117). Londres, UK: Sage.
- Hart, S. L., & Christensen, C. M. (2012). The great leap: Driving innovation from the base of the pyramid. *MIT Sloan Management Review*. Retrieved from <http://sloanreview.mit.edu/>
- Jhunjhunwala, A., Ramachandran, A., & Bandyopadhyay, A. (2004). n-Logue: The story of a rural service provider in India. *The Journal of Community Informatics*, 1(1), 30-38.
- Johnston, B., & Maguire, T. (2005). *Adult numeracy: Policy and practice in global contexts of lifelong learning* [Working papers]. Retrieved from <http://www.staff.vu.edu.au/alnarc/revamp/publications/05bettyjohns.pdf>
- Kempson, E., & Collard, S. (2012) *Developing a vision for financial inclusion*. Friends Provident Foundation, Pixham End, Dorking, Surrey, University of Bristol, UK. Retrieved from <http://www.bristol.ac.uk/media-library/sites/geography/migrated/documents/pfrc1205.pdf>
- Kinsley, T. (1998). The information revolution: Community, a journal of community. *Building for Community Leaders*, 1(1), 23.
- Kunt, A. D., Klapper, L., Singer, D., & Oudheusden, P. V. (2015). *The global index database 2014: Measuring financial inclusion around the world*. The World Bank. Development Research Group. Finance and Private Sector Team. Washington, D.C, USA.
- Landvogt, K. (2006). *Critical financial capability. Financial Literacy, Banking and Identity Conference*, RMIT University.
- Madon, S. (2003). *Evaluating the developmental impact of e-governance initiatives: An exploratory framework* [Working Paper 124]. Department of Information Systems, London School of Economics, London, UK.
- Maguire, T., & O'Donoghue, J. (2003). Numeracy concept sophistication: An organizing framework, a useful thinking tool. In J. Maaß, & W. Schlöglmann (Eds.). *Learning mathematics to live and work in our world*. ALM-10. Proceedings of the 10th international conference on Adults Learning Mathematics in Strobl, Austria (pp. 154-161). Linz, Austria: ALM and Johannes Kepler Universität Linz.
- Mansell, R. (2004). Political economy, power and new media. *New Media and Society*, 6(1), 74-83.
- Mansell, R., & Wehn, U. (1998). *Knowledge societies: Information technology for sustainable development*. New York, USA: Oxford University Press.
- Mas, I. (2009). The economics of branchless banking. *Innovations*, 4(2), 57-75. doi:10.1162/itgg.2009.4.2.57
- Mayoux, L. (2010). Reaching and empowering women: Towards a gender justice protocol for a diversified, inclusive, and sustainable financial sector. *Perspectives on Global Development and Technology*, 9(3-4), 581-600. doi:10.1163/156914910x499822
- Mello, C. (2012) Articulação da #RedesemRede para a promoção da inclusão socioprodutiva. *Inclusão Social*, 5(2), 183-186.
- Mettenhein, K. E., Diniz, E., & Gonzalez, L. (2014). New Perspectives on banking and agendas for financial inclusion. *Journal of Management and Entrepreneurship*, 7, 5-42.
- Micro Insurance Agency. (2008). *Financial education in the changing landscape of the developing world*. Retrieved from www.microfinanceopportunities.org/docs/FE_in_the_Changing_Landscape.pdf.
- Miles, M., & Huberman, A. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, EUA: Sage Publications.

- Organisation for Economic Co-operation and Development. (2006). The importance of financial education. Retrieved from <http://www.oecd.org/dataoecd/8/32/37087833.pdf>.
- Okech, A., & Torres, R. M. (2005). *Rwanda: Study of literacy needs and programmes for youth and adults* [Background paper]. Ministry of Education, Science, Technology and Scientific Research, Final Report, Kigali, Rwanda.
- Orlikowski, W. (2000). Using technology and constituting structures: A practice lens for studying technology in organizations. *Organization Science*, 11(4), 404-428. doi:10.1287/orsc.11.4.404.14600
- Parikh, T. S. (2006). Rural microfinance service delivery: Gaps, inefficiencies and emerging solutions. *Information and Communication Technologies and Development*, 223-232. doi:10.1109/ictd.2006.301861
- Parker, S. R. (2013). *Linking electronic payments and social cash transfers in India*. CGAP. Retrieved from <http://www.cgap.org/news/linking-electronic-payments-and-social-cash-transfers-india>
- Paul, J. (2004). What works: n-logue's rural connectivity model: *Deploying wirelessly-connected internet kiosks in villages throughout India*. A Digital Dividend Study by the World Resources Institute. Washington, DC: World Resources Institute. Retrieved from <http://www.digitaldividend.org/pdf/nlogue.pdf>
- Pozzebon, M., & Diniz, E. H. (2012). Theorizing ICT and society in the Brazilian context: A multilevel, pluralistic and remixable framework. *BAR-Brazilian Administration Review*, 9(3), 287-307. doi:10.1590/S1807-76922012000300004
- Prasad, P. (2005). *Crafting qualitative research: Working in the postpositivist traditions*. Armonk NY: M. E. Sharpe.
- Rahman, H. (2006). *Empowering marginal communities and information networking*. Hershey: Idea Group Publishing.
- Rhyne, E., & Otero, M. (2006). *Microfinance through the next decade: Visioning the who, what, where, when and how*. The Global Microcredit Summit. Retrieved from www.microcreditsummit.org/papers/Plenaries/RhyneOtero.pdf
- Sabbaghi, O., Cavanagh, S. J. G., & Hipskind, S. J. T. (2013). Service-learning and leadership: Evidence from teaching financial literacy. *Journal of Business Ethics*, 118(1), 127-137. doi:10.1007/s10551-012-1545-6
- Sama, L. M., & Casselman, R. M. (2013). Profiting from poverty: Ethics of microfinance in BOP. *South Asian Journal of Global Business Research*, 2(1), 82-103. doi:10.1108/20454451311303301
- Serviço Brasileiro de Apoio às Micro e Pequenas Empresas. (2010). *Presentation at the headquarters*.
- Sempere, M. (2009). Evaluación de la alfabetización: *El proceso de crear un marco de evaluación para el enfoque REFLECT*. International reflections on issues arising from the benchmarks and call for action. Retrieved from <https://www.dvv-international.de/es/educacion-de-adultos-y-desarrollo/ediciones/ead-712008/reflexiones-internacionales-sobre-aspectos-derivados-de-los-puntos-de-referencia-y-del-llamamiento-a-la-accion/evaluacion-de-la-alfabetizacion-el-proceso-de-crear-un-marco-de-evaluacion-para-el-enfoque-reflect/>
- Sen, A. (1999). *Development as freedom*. New York, USA: Knopf.
- Servon, L., & Kaestner, R. (2008). Consumer financial literacy and the impact of online banking on the financial behavior of lower-income bank customers [Special Issue: Financial Literacy: Public Policy and Consumers Self-Protection]. *Journal of Consumer Affairs*, 42(2), 271-305. doi:10.1111/j.1745-6606.2008.00108.x
- Stake, R. (2005). Qualitative case studies. In N. K. Denzin & Y. S. Lincoln (Eds), *The SAGE handbook of qualitative research* (3rd ed., pp. 443-465). Thousand Oaks, CA: Sage.
- Vacher, H. L., & Wallace, D. (2008). The scope of numeracy. *Numeracy*, 1(1). Retrieved from <http://scholarcommons.usf.edu/numeracy/>. doi:10.5038/1936-4660.1.1.1
- Walsham, G. (1995). Interpretive case studies in IS research: Nature and method. *European Journal of Information Systems*, 4(2), 74-81. doi:10.1057/ejis.1995.9
- World Bank. (2000). *World development report 2000/2001: Attacking poverty*. New York, USA: Oxford University Press.
- Xu, L., & Zia, B. (2012). *Financial literacy around the world: An overview of the evidence with practical suggestions for the way forward*. The World Bank. Development Research Group. World Bank Policy Research Working Paper 6107. Washington, DC, USA..
- Yunus, M., Moingeon, B., & Lehmann-Ortega, L. (2010). Building social business models: Lessons from the Grammen Experience. *Long Range Planning*, 43(2-3), 308-325. doi:10.1016/j.lrp.2009.12.005