Knowledge societies, seen from the South: local learning and innovation challenges

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Introduction

The development of science and technology (S&T) as the main productive forces in our contemporary world is related to a set of social, political, economic and cultural changes, showing the transformative potential of knowledge and has given rise to the notions of information and knowledge era, society or economy around two main phenomena:

- the rapid development and diffusion of information and communication technologies (ICT), which allow processing, storage and transmission of great quantities of data at low cost and high speed, and – among other applications – favour the formation of all sorts of networks connected by these new electronic media and digital formats, in real time and on a planetary scale;
- the new role of knowledge, learning and innovation as strategic factors of productivity, competitiveness, differentiation and inequality for workers, firms, economic sectors, countries and regions, as well as of economic and social development.

Understanding and dealing with these phenomena is an immense challenge in at least two crucial spheres. The first is the urgent need to revise and perhaps subvert sedimented ideas, theories and methodologies, requiring an interdisciplinary effort to confront and articulate the diversity of issues involved. The second is the unavoidable implications of the phenomena for social and economic development policies.[1]

In the case of peripheral countries, or the South, these challenges are even greater, considering the relevance of constructing a theoretical and methodological framework appropriate to their specific realities as well as the urgent need to build political strategies that take into consideration their potentials and limits to development. One of our central arguments here is that, together with the apparently infinite possibilities of knowledge diffusion offered by the increasing expansion of ICT, new forms of social polarisation and economic exclusion are being created. These are linked to unequal access to new opportunities to acquire and renew the knowledge bases and skills that are required for development. The fundamental contradiction of the present mode of the globalisation of knowledge is that while a few countries, firms and institutions act as the main generators of new knowledge and innovations, most of the world is relegated to the role of user. The interests involved in expanding the

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ISSJ 195 © UNESCO 2009. Published by Blackwell Publishing Ltd., 9600 Garsington Road, Oxford, OX4 2DK, UK and 350 Main Street, Malden, MA 02148, USA.

reach of ICT to all corners of the world come up against existing geopolitical patterns of inequality and exclusion, which tend to create and reproduce forms of concentration and the privatisation of knowledge, eventually limiting such expansion.

The widening of the digital divide and the barriers to the expansion of this mode of global knowledge refer not only to accessing and using new technologies but also, most importantly, to the capacity to learn, absorb and generate new knowledge and innovation: the learning divide (Arocena and Sutz 2003). Thus, information and knowledge are now strategic factors in the dichotomy of social inclusion and exclusion and a source of geopolitical and economic hegemony, as a consequence becoming not only objects of funding and public policies but also targets of growing privatisation. The results of advanced scientific activity, given its complexity and high costs, come increasingly under the control of large-scale economic agents located in the main power centres of the world. This has accentuated the gap between central and peripheral countries, which reflects the unequal socio-spatial distribution of strategic knowledge, information and innovation capacity (Lastres and Albagli 1999).

Another central argument is that the capacity for technological and social innovation – which presupposes the production and diffusion of knowledge – is configured more by social conditions in cultural and institutional environments than by the availability of material resources. The immaterial changes that occur in the production of intangibles and the qualitative transformation of knowledge, much more than its quantitative accumulation, suggest new perspectives for socioeconomic development. Therefore, based on the premise that knowledge is a strategic factor for economic accumulation and social development, our general objective is to understand specific social configurations of the mode of articulation of social, economic and intellectual factors of development, as seen from the point of view of developing countries. Our contribution to this debate focuses on the importance of local learning and innovation processes, which take into account the specific conditions of developing countries, as a counterpoint to the globalised knowledge perspective.

The first part of the article presents and discusses the main currents of thought on these issues from a critical and historical perspective, considering in particular the view and the contributions from the South. This theoretical debate is then enriched and complemented with the results of empirical studies on local knowledge flows and innovation in Brazil.

Information society and knowledge society: historical and geopolitical perspectives

The relation between knowledge and socioeconomic change attracted attention and generated discussion especially in the wake of the Second World War – particularly as to the role played by S&T – although many of the classical authors in the social sciences (Marx, Weber, Mannheim and Merton, among others) had already confronted the issue.

In the second half of the twentieth century science came to be seen no longer as a heterodox social institution but as one with a strategic role in the economy and society, as a productive force and a commodity. This marks the beginning of the development of science policies, a new stage in the destiny of modern society and the recognition that the search for knowledge is one of society's essential functions (Salomon 1973).

Under the influence of Vannevar Bush's historic report to the president of the USA in 1945, and given the intensification of an arms race based on scientific and technological competition, S&T policies became generally directed towards national security and geopolitical hegemony. Also important at this point was the understanding that there was a linear movement in which scientific knowledge automatically pushes technological development which, in its turn, feeds the market and stimulates the productivity of companies and thus, socioeconomic development.

Adopting this general philosophy, Brazil and other Latin American countries started after 1950 to build the institutional foundations of governmental support for S&T. In this effort, UNESCO and the Organisation of American States played a decisive role. Implicit in their

directives was the idea of a neutral and universal science, the development of which would naturally spill over to the productive sphere and generate positive results for the whole of society (Albagli 1988). On the continent this period also coincided with the expansion of a development ideology known as ''developmentism'', forged by the Economic Commission for Latin America (CEPAL). This ideology was expressed in government policies to promote industrialisation based on import substitution and protectionist measures. It is, however, important to note that CEPAL's theses presupposed the possibility of importing techniques and equipment developed in the central countries, thus leaving aside the issue of access to capacity building in S&T. This was later admitted by Celso Furtado (1985), one of the CEPAL theorists. Because they exclusively considered primary export activities, these theories tended to assume that the industrialisation of the continent would in itself result in its autonomous development, reflecting the European Industrial Revolution model of the eighteenth and nineteenth centuries. For this reason, those policies were not accompanied by significant efforts towards technological development.

After the Second World War, with the accelerated expansion of the transnational conglomerates and of a new stage in import substitution, there was a phase of denationalisation of Latin American industry. These developments strengthened the roles of the ''centre'' as generator of scientific and technological knowledge and of the ''periphery'' as its consumer and user. In the 1970s the rhetorical emphasis of Latin American government policies in this field moved from support for science to support for technology as a prerequisite for the consolidation of industrial infrastructure. It was also at this time that Latin American authors began to produce a rich interdisciplinary literature dedicated to the constitution of an analytical framework to deal with the relations linking science, technology and development. Particular emphasis was put on their role as instruments in the reduction or increase of national economic dependence. The need to promote interaction among the various relevant actors in the process of incorporating S&T into development defined most of the Latin American intellectual production in this period, especially over Sabato and Botana's (1968) notion of the triangle, defining the central role of government in its relation to industry, universities and research institutes to encourage S&T progress. Another influential theory was that of Hebe Vessuri's (1983) hybrid community of scientists, politicians, technicians and company owners in favour of development strategies that relied on effective government support. The importance of a national development project that included S&T activities was emphasised by Amilcar Herrera, who at the time was one of the protagonists of Latin American intellectual production in this field, and for whom ''an effective science policy is not the origin of a profound and conscious effort of development, but rather one of its consequences'' (Herrera, 1976 [1971], p.67). Simply put, it was thought that their relative backwardness in S&T was not a cause of Latin American underdevelopment but the result of a dependent development model (as formulated by Cardoso and Faletto 1970) that was incapable of translating the enormous social necessities into S&T policies and strategies.

In the 1960s and 1970s, together with a general preoccupation with the negative impacts of technical progress and with the social responsibility of scientists, a debate also emerged about the specificities of science in the periphery, and the idea of appropriate technology. This idea was greatly criticised in developing countries, where it was interpreted as an incentive to produce and use second-class technology. Since then, socio-technical transformations have made innovation – in its broader sense: technological, organisational and social – a key concern of both academic research and development policies. It is in this context that debate emerged on the international scene between, on the one hand, neo-Schumpeterian and evolutionary economic theory (Nelson, Winter, Freeman, Dosi and Perez, among others) and, on the other, regulation theory (Coriat, Lipietz, Chesnais and Boyer, among others).

Influenced by Joseph Schumpeter, who valued the capacity for creative destruction in the innovative entrepreneur, the first group countered neoclassical currents in emphasising the role of technological innovation for economic dynamism and proposed the notion of technological paradigms (Dosi 1982; Freeman and Perez 1988). The problem with this notion was the role

attributed to technological innovation as a determining factor of development. For this reason, the regulationists took issue with Schumpeterian technological determinism and, inspired by Marxist theory, argued that social relations of production drive technological choices and applications. Emphasising the historical and institutional constructions that regulate S&T, regulationists contended that S&T do not have determining power and defined them as social products. Later, in the 1990s, these currents would partially converge as to the importance of institutions, sociocultural conditions and the role of the state and public policies in the relations among science, technology and development.

During this period there was a growing tendency among economists to confer greater explanatory capacity to existing theory by introducing factors and actors that until then had been generally considered external to the economy. The social processes that produce change were thus perceived to be essential to understanding economic processes. Seen from this perspective, social actors and their interactions gained new relevance in economic theory. It was not by chance that this context also gave rise to the new economic sociology inspired by Weber, which raises the issue of social determinants of economic processes (Granovetter and Swedberg 1992). In this same period the interest in renewing theory by introducing the social conditions in which the economy develops also resulted in the debate on social capital and trust (very loosely defined and, in some cases, apparently synonymous), which some authors (Putnam, Fukuyama and Locke) have regarded as one of the main factors of economic growth and success, as well as of interactive learning (Lundvall 1992). Nevertheless, such interpretations frequently posed more problems than they solved. It would seem that these components of social relations can be transformed into instruments or tools for local innovation and development and that they are something that can be translated into quanta and thus, conceivably, be (re)produced (Albagli and Maciel 2007a). This may also lead to a perspective that advocates certain characteristics of social relations as preconditions for economic performance, competitiveness and innovative capacity – a path-dependency or deterministic perspective that could relegate developing countries or regions to a subordinate role in the world system and exclude any possibility of alternative roads to development. On the other hand, when the focus is on the analysis of social processes instead of recipes for success there is less danger of falling into the trap of trying to define a social relation by its effects (Albagli and Maciel 2007a).

From another perspective, that of developing countries, all these theoretical debates would have important repercussions in Latin America and in Brazil, with their specific political, social and macroeconomic conditions and the vicissitudes of their insertion in a globalising economy. The main thrust of this reinterpretation in the continent has been to show how the technological gap and the polarisation of innovation capacities between North and South tend to deepen with the acceleration of technological change and how such a polarity reflects internal social, political and economic conditions in developing countries, which are added to international pressures reinforcing those inequalities. Since the last decades of the twentieth century these transformations in the technical-scientific paradigm projected the theme of the information and knowledge society onto political and academic arenas. In this they are assisted by the development and diffusion of a set of generic technologies and particularly by new ICT.

The expression knowledge society was first coined by Fritz Machlup (1962) and then developed by Peter Drucker (1968). By the mid-1970s, Daniel Bell (1973) suggested that a post-industrial society had emerged. Later, Marc Uri Porat (1976) introduced the notion of the information society. These first approaches were, in general, based on strictly economic foundations, in light of the significant changes in occupation and employment structures associated with the considerable displacement of the workforce to activities connected to information and knowledge. These approaches did not yet express a recognition of profound and complex transformations related to the new role of information and knowledge in the contemporary world. In the 1980s and 1990s many countries began to adopt policies and strategies designed to implement the necessary conditions for capitalising on these innovations. They were initially directed towards building a worldwide ICT infrastructure, which came to be called the information highway. Universal access to this

infrastructure was considered at first to be a central issue, a response to the demands of accumulation in which the production and circulation of goods, particularly the intangibles, including financial capital, were more and more dependent on the expansion and intensified use of electronic networks (Albagli and Maciel 2007b).

The main problem with these approaches is that they examined the issue predominantly from the point of view of advanced economies. There is, however, an obvious need to review the concept in the context of developing countries. The globalisation of the ideology of a homogenously distributed and accessible knowledge tends to hide the central issue of the power structures and relations in which inequality tends to be exacerbated. The fallacy of the concept of a knowledge society lies precisely in that it presupposes, or suggests, the existence of a homogeneous socioeconomic distribution of knowledge and thus of the benefits of the new paradigm. But it is quite evident that the differences between countries, regions and social groups and classes are increasingly due to their unequal access to knowledge and information (Stehr 1994).

The construction of a communication infrastructure, while it is a fundamental condition for realising the potential of ICT, has been shown to be insufficient to promote major changes in the technical-productive system. Nor has it proved to guarantee benefits for all social groups, countries and regions. It thus became evident that a set of measures and actions of much greater scope and broader dimensions was needed in order to broaden the diffusion of these technical-productive transformations as well as to avoid the deepening of social and territorial inequalities. Gradually, this process came to be understood from a broader perspective, in which the technological aspect, although essential, had to be seen alongside geopolitical, social, economic and cultural issues. The issue of exclusion or of a divide, which obviously is not merely digital, is expressed in the concentration – in regions, countries and multinational corporations – of production of and access to strategic knowledge, as well as in policies and conflicts related to intellectual property rights. As argued by Arocena and Sutz (2003), among others, the diffusion of technology makes no sense without the development of internal and external conditions favourable to understanding, learning, producing and incorporating new knowledge.

Our main focus here is not simply the production of information and knowledge but also, more importantly, its circulation and appropriation. The focus should therefore not be on the acquired or accumulated stock or set of useful knowledge, nor on pre-packaged programmes, recipes or models of development but rather on the interaction that stimulates expanded circulation of knowledge.

Information, knowledge and innovation: the local dimension

Examining the circulation of knowledge by its interaction with and its role in innovation and development necessarily implies distinguishing between codified and tacit knowledge. This distinction was introduced by Michael Polanyi (1966), observing that what we know is more than we can tell or describe. Since then, many other authors have elaborated on this distinction and its implications regarding access to and use of knowledge. Among these are theories on organisations (such as Nonaka and Takeuchi 1997), as well as the aforementioned evolutionary current of economics.

Tacit knowledge is understood to be that which is not documented or made explicit by whoever uses or possesses it. According to Polanyi (1966), it is knowledge of which we are not entirely conscious, which is subsidiary and already incorporated, allowing us to focus our attention on new tasks and specific problems. This knowledge resides and is developed in beliefs, values, know-how and the abilities of each individual and organisation; it derives from experimentation and the diffusion of new practices through local interaction and comes from learning by doing, learning by using and learning by interacting (Lundvall and Johnson 1994). Since it is specific to each context and type of activity, the more tacit knowledge is the more difficult it is to share, recognise and evaluate. The challenge therefore is to identify the processes, and the multi-articulated webs of social actors in which tacit knowledge is

produced and transmitted. Codified knowledge, on the other hand, is more easily described. It can, for the most part, be mapped out with existing data on such fields as education, basic and applied science, publications, patents and human resources, and is thus transformed into information.

This distinction, of a more epistemological character, has clear implications for our discussion on access to information and knowledge. In this respect, reviewing the pertinent literature in different fields of knowledge, it is possible to identify two major positions, which represent the extremes of a more diverse range of opinions. On one hand, there is the argument that all knowledge can be codified and that the decision to do so is simply a matter of the cost benefit of doing so. The development of ICT, in contributing to reducing the costs of codification, would thus favour the reduction of that tacit part of knowledge, broadening the possibilities of communicating or displacing knowledge in time and space (Dasgupta and David 1994; Cowan *et al.* 2000). From this point of view, codified knowledge, because of its presumed transferability, is assumed to be globally available, which places ICT and digital inclusion in a central role.

From a different perspective, the assumption that explicit knowledge is easier to transmit is questionable (Gertler, 2003). It is currently thought that codified knowledge, if it is to be appropriated and used, requires tacit knowledge (Nightingale 2003). In this view, tacit knowledge is presumed to be "sticky", in that it tends to be localised in some fashion. Thanks to ICT, codified knowledge (transformed into information) may be displaced or deterritorialised, but it will have to be relocalised, reterritorialised and reconstructed in order to be apprehended and employed as tacit knowledge (Yoguel 2000). In other words, with the spread of ICT, information and codified knowledge can be more rapidly and easily produced and diffused throughout the world. However, non-codified knowledge, which remains tacit, is only communicated in interactive learning in localised social processes embedded in specific environments and organisations.

In fact, the creation, diffusion and use of knowledge, whether codified or tacit, occur and are moulded in a social environment and in collective structures where individuals and organisations interact. In order to develop, expand and complement their specific knowledge these individuals and organisations need to interact in interpersonal relations. In this interaction, learning and knowledge develop according to communication processes mediated by specific conceptual, cultural and institutional frameworks. Considering the need to combine, and the importance of combining, diverse forms of knowledge from a variety of sources, "knowing how to communicate, to cooperate and to interact becomes much more important than before" (Lundvall and Johnson 1994, p.25).

In this context, local learning capacity is strategic; it involves the construction of several types of knowledge, experiences, competencies and skills, and is not limited to access to information. It involves the capability of developing new routines, abilities and social practices (Lundvall and Johnson 1994). Much of the work focusing on regional innovative capacity demonstrates the impact of its geographical concentration on learning (Sutz and Arocena 2003). Thus it is necessary to "distinguish between [information and communication] technologies that can be imported and innovation capabilities that must be home grown as an outcome of the workings of a societal system" (Humbert 2003, p.200).

The greater facility of diffusion of diverse forms of codified knowledge (through ICT) emphasises the strategic role of tacit knowledge as a source of a differentiated level of innovation, competitive advantage and of local social development. Tacit knowledge is thus considered a determining factor in the geography of innovation, in that its central role in the process of learning by interacting tends to reinforce the local over the global (Gertler 2003).

Thus, productive territorial agglomerations have been seen as environments that favour interaction and exchange of knowledge and learning, stimulating innovation. They have been defined and described in numerous concepts and approaches such as industrial districts (Marshall 1890), *milieux innovateurs* (Aydalot 1986), national and local systems of innovation (Nelson, Lundvall, Freeman and Edquist),[2] clusters (Porter 1990; Schmitz 1995), local productive arrangements (Cassiolato and Lastres 1999) and so on. It has been argued that in these local interactions there are knowledge

spillovers that contribute to collective knowledge which, as pointed out by Alfred Marshall, are in the air. It is not merely the sum of knowledge of individuals and organisations; rather it is the result of synergies generated in the various types of interaction.

Our research on diverse productive agglomerations in Brazil, in various cultural and institutional environments, contributes to understanding the specific characteristics of local dynamics of interaction and exchange of knowledge and information.[3] They are quite different from each other in several respects, particularly regarding their history, their duration, the predominant type of activity (high or low tech) and their dimensions. These differences are associated with the dynamics of tacit knowledge flows and they directly affect their innovative capacity and their conditions of development.

From our analysis of research results we can extract a few general conclusions, summarised below. In discussing whether tacit knowledge is best transmitted in physical proximity and in groups with a similarity of interests or professions, what has been observed in our empirical research is that the diffusion of tacit knowledge is best accomplished through face-to-face interactions among partners who already share basic similarities. Geographical proximity takes centre stage. Local knowledge flows are activated through formal and informal contacts.

Although formal and intentional means of interaction and cooperation have generally been privileged in empirical studies on local systems of innovation, informal and non-intentional means are, in some cases, more relevant – especially in environments where the level of cooperation is not very high. Much of the tacit knowledge produced in organisations results from learning by doing and by interacting – with suppliers, competitors, clients and financers, including even the mere direct observation of their strategies, mistakes and right moves, even when there is no explicit cooperation. This argument is relevant to the understanding of not so ideal (or idealised) situations of productive agglomerations or other dynamics of local interaction (Albagli and Maciel 2007b).

Particularly in cases where there is a predominance of traditional, low-tech sectors, there is very little technical knowledge, a low level of formal instruction and a flimsy knowledge of business administration. Knowledge development and learning processes in these cases are based predominantly on experimentation and on learning by doing. Actors increasingly feel the need for qualification and innovation, due to greater demand for quality and sophistication in the products, caused by more intense competition and market globalisation. Where activities are mostly centred on more sophisticated technologies, owners are for the most part highly qualified, with university degrees and usually very young.

In any case, however, firm owners are generally reluctant to exchange information, particularly information that is considered to be strategic to production. In some cases it was possible to verify a very low level of cooperation among firms and between them and other institutional actors. On the other hand, there was some knowledge spill-over to the system as a whole. This exchange was unstructured and happened sporadically and informally, and is therefore difficult to map out. Although this is generally considered to impede the characterisation of such an agglomeration as a cluster along traditional lines, it does not inhibit the diffusion of knowledge relevant to local innovation, although it may inhibit its sustained development in the future. In many of the more traditional cases there is indirect contact through the products themselves by means of shop windows and personnel mobility. Meetings organised by local institutions, fairs, trips and other events of this nature also encourage closer ties, which may promote local communication.

Where high-tech activity predominates, on the other hand, the knowledge flows and spillovers tend to reach beyond local frontiers. In some cases there was a rather high intensity of circulation, communication and learning, involving both codified and tacit knowledge, through the circulation of people among various environments – such as firms, universities, research laboratories, government offices and consulting firms – carrying with them the knowledge they had acquired. Particularly interesting, in this respect, is the fact that in some cases (especially in high-tech industries), individuals are not physically located in the same town, which indicates that the boundaries of a local system are not formally defined, and that horizontal personal mobility promotes the flow of knowledge.

Local relations and flows of information are also strongly mediated and influenced by the structure and dynamics of local governance. Weak ties with the local business community and a strong hierarchy of relations and excessively technical language in entrepreneurial qualification represent a barrier to the flow of information and knowledge, particularly for new entrants in the low-tech or traditional sectors. Another obstacle to the development of denser knowledge flows can be found in the process of the original cluster formation. Thus, where the beginnings of the system originate from top-down political or technocratic strategies there is little interaction between entrepreneurs, institutions and civil society; where the development of the system originates from horizontal and bottom-up strategies, knowledge seems to flow more easily between different groups of actors, resulting in some institutional learning.

For countries in the periphery or the South it is vitally important to consider the local dimension of cognitive and innovation dynamics. At this local level the breaches and opportunities for the realisation of potential and the comparative advantages derived from the capitalisation of specific immaterial resources can be found. This is also where one can find the preconditions for a more advantageous insertion in the global scene: the establishment of social environments favourable to social interactions and synergies relevant to the processes of generation, dissemination and use of knowledge.

Confronting perspectives

Most of the work done on the significance of the information and knowledge society can be roughly organised in two main perspectives, which address the complementary and not necessarily exclusive issues of global and local knowledge. To put things very schematically:

- One perspective focuses on the double-sided movement of globalisation and concentration of knowledge, considering, on the one hand, the new possibilities for the circulation of codified knowledge with the development and diffusion of information and communication technologies and, on the other, ever more rigorous instruments of intellectual property rights.
- The other focuses on the appraisal of necessary local (social, cultural, economic, institutional) characteristics and conditions for the production, diffusion, appropriation and use of knowledge, especially tacit knowledge, in innovative and development processes.

One point of convergence between these two perspectives is the recognition of the importance of interaction among multiple social actors – institutions, organisations, social, political and economic actors – signalling the existence of paradigmatic changes in production and circulation of knowledge, as had already been suggested in the concepts of "Mode 2" knowledge production (Gibbons *et al.* 1994), the network society (Castells 1996), the triple helix (Etzkowitz and Leydesdorff 1998) and innovation systems (Edquist 1997; Lundvall 1992; Nelson 1993), among others.

The point in question here is: does this broaden the range of possibilities for developing countries or the South? Seen from the South, it is a matter of questioning the legitimacy and the scope of the notion that we live in a global knowledge or information society and of overcoming the idea that a unique, predetermined course of action is inevitable. It is thus necessary to broaden and deepen the theoretical and conceptual framework that guides this discussion in order to develop further a point of view based on the perspectives, characteristics and potentialities of each socio-territorial context. In other words, we must be able to construct, albeit within certain guidelines, different alternatives for the future. These must take into consideration our relative position (peripheral or semi-peripheral) in the world power system and our characteristically multicultural societies in which social diversity is, without doubt, an immensely favourable element for innovation. It must be recognised, on the other hand, that although these ideas involve a great diversity of aspects and interpretations as to their meaning and scope, they are emblematic of a few essential traits that characterise our time, underlining the strategic role of information and knowledge.

This discussion must address issues such as: (a) the distinction between the concepts of

information and knowledge, as well as between possibilities of access to each; (b) the relatively greater importance of tacit knowledge *vis-a-vis* codified knowledge; (c) recognition that the new ICTs, despite providing greater diffusion of information and codified knowledge, do not prevent the territorial concentration of knowledge (Albagli, 2006). This is because of the increasing privatisation allowed by the mechanisms of intellectual property rights, as well as the impossibility of sharing tacit knowledge through electronic networks.

In effect, the diffusion of ICT and ample access to it are strategic, but they can also constitute instruments of dependence (on technologies, equipment, contents, lifestyles and consumption patterns) and reproduction of inequality. Therefore, (pro-)active participation in the information society requires more than digital inclusion. It is not enough to create the necessary conditions for the social appropriation of the technological apparatus, which implies the capacity of different social groups to make use of the new instruments and tools, aiming at better living and working conditions. More important is the need for social capability of appropriation of information and knowledge, which is indispensable for learning, innovation and development. This will require ample access to the relevant material equipment, to educational opportunities, to work, employment and income, as well as the right to full citizenship, to political and economic democracy and to cultural diversity.

Conclusion

Since the term knowledge society can, in some formulations, imply that knowledge has already been acquired and is accessible to a society as a whole as well as to a global society, the idea of a learning society seems especially interesting for developing countries because it emphasises the process of learning and, therefore, of change and development. The creation, diffusion and use of knowledge occur and are moulded in a social environment and in collective structures where individuals interact. Learning and knowledge develop in this interaction, in communication processes mediated by specific conceptual, cultural and institutional frameworks.

Thus, our research points to key elements of local learning and innovation for development: the existence of formal and informal communication channels and of socially shared codes, values and languages that foster local knowledge flows and favourable sociocultural, historical and institutional conditions for interaction and learning by interacting.

National and local conditions may lead to completely different paths and to a growing diversity, instead of the standardisation and convergence suggested by the more radical theses of the influence of globalisation on national and sub-national systems. There is no single solution and policy prescription; instead there are a myriad of alternatives that could take different forms for different societies in different places and times. Social formations are complex structures that cannot be seen as the mere products of planning strategies or policies: they are the result of social construction in historical processes of collaboration, competition and conflict, in which public and private policies and strategies play an important role.

This understanding is crucial to the analysis of innovation in developing countries, especially in Latin America, where certain cultural characteristics such as personal and emotional relations interfering in what should be rational and impersonal economic decisions have often been considered to be obstacles to development. But values such as trust and loyalty are now repeatedly considered fundamental in the new economic paradigm, and the relational society seems to be more attuned to the times, the spaces and the articulations of social and productive systems in transformation. In many cases, abilities that have developed through history in order to cope with extraordinary difficulties result in a capacity for flexibility and agile response to challenges that is regarded as a competitive advantage in the contemporary economy.

The point here is that there is no single model that must be followed, and that no culture has a monopoly on the factors for successful socioeconomic development. Each case must be studied according to its peculiarities, its specific characteristics and the international context, with its limitations and opportunities, in order to evaluate the specific strategies and mode of

development that should be applied in each case. Thinking locally may be a fruitful strategy to understand the possibilities of development in the South. In fact, the processes of articulation and interaction among the various political forces and diverse social actors involved seem to be more effective and more viable when they occur from the bottom up – from municipalities to the region, from the region to the country and so on (''glocalisation'' as a counterpoint to globalisation).

Innovative socioeconomic development implies the democratisation of knowledge. In this sense, we can propose a(nother) definition of innovation, where it consists of the development of new forms of producing, applying and distributing knowledge. The focus therefore is on building a conceptual framework and a political strategy to promote the relations, which now need to be much closer, between the production and circulation of knowledge and socioeconomic development.

Notes

1. The authors gratefully acknowledge research grants received from *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq) and *Fundação Carlos Chagas de Apoio* à Pesquisa do Rio de Janeiro (Faperj).

2. The concept of national systems of innovation was formulated in the mid-1980s, in work done by Cristopher Freeman (1982), Bengt-Ake Lundvall (1992), Richard Nelson (1993) and Charles Edquist (1997), unfolding thereafter to include the notion of local systems of innovation.

3. This discussion is based on results of empirical research done by the authors in productive territorial agglomerations in Brazil, in more traditional sectors such as clothing and ornamental stone as well as in high-tech sectors such as software and IT.

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