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Scope and limitations in the evaluation of programs for digital teaching in Latin America

A paradigmatic case: the 'Plan CEIBAL'

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This article reviews in the first place the state of monitoring instruments for digital education programs in the region and secondly, it evaluates, from a critical perspective, the limitations imposed by quantitative indicators for the comprehension of the socio cultural scope of these programs. Qualitative evaluation strategies that recover the subject's viewpoint enable the development of more comprehensive indicators of the experience of ICT appropriation for the beneficiaries of these programs.

Keywords: Digital education, quantitative indicators, quality evaluation, perspective of the actor

Este artículo, en primer lugar revisa el estado actual de los instrumentos de monitoreo de los programas de alfabetización digital en la región, y en segundo término, propone, a partir de una mirada crítica sobre las limitaciones que imponen los indicadores cuantitativos para la comprensión del alcance socio cultural de dichos programas, estrategias de evaluación cualitativa que tengan como premisa la recuperación de la perspectiva del actor, y en consecuencia, permitan, elaborar indicadores más comprensivos de la experiencia de apropiación de las TICs entre sus beneficiarios.

Palabras clave: Alfabetización digital, indicadores cuantitativos, evaluación cualitativa, perspectiva del actor

CONCERN IN MONITORING digital education in the region is not a new thing. Given the need to count on joint actions and a solid sector inter-relationship for public policies in ICT, several countries of the region have adopted strategies on a national level to co-ordinate the actions and efforts within a horizon of expectations previously defined by citizens and governments.

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ECLAC, adopted in its agenda for ICT in 2000, the creation of the Program for the Information Society. This Program backed, in turn the installation in 2005, of the Action Plan for the Information Society of Latin America and the Caribbean (eLAC) thus generalizing on a regional level the assumption of ICTs as key elements in the development agenda. This initiative proposed building a platform for promoting regional integration and co-operation in ICT topics, thus articulating the objectives at an international level with the region's priorities. The Millennium Development Goals, whose first one is the eradication of extreme poverty by the year 2015, have been incorporated in the wake of the actions of the eLAC, as well as the goals agreed upon in the Second World Summit for the Information Society (2005)¹.

Some of the main aims of the Compromiso de San Salvador (San Salvador Commitment) which was agreed upon in the meeting of the eLAC 2008 include: backing initiatives for the development of networks-based communities (such as telecenters); expanding the outreach of high speed Internet in urban areas to 70 per cent; increasing the number of centres with access to ICT serving the community; elaborating comparative studies on the social and economic impact of ICT in government political agendas; and developing indicators that reveal the progress of digital education in the region.

The eLAC 2010 is the second version of the Regional Plan for Information Society in the Latin American and Caribbean region². This plan, which covered the three year period of 2008-2010, presented new challenges and a deeper study in several of the goals of the first design of this strategy for regional development which was active during 2005-2007. The evaluation of the plan revealed that of the monitored lines of action, five showed progress while 12 presented moderate or insufficient progress and a set of conclusions was reached, among these, that the "conceptual separation between access, abilities, applications and policies, can lead to a non-integral focus of digital development"³. In the area of education, during the evaluation carried out in December 2009, outstanding features were the new initiatives encouraged in recent years, such as the start-up of the *Enlaces* program in Chile, OLPC in Peru and Plan CEIBAL in Uruguay.

Of the six highest priority areas of t eLAC (education, infra-structure and access, health, public management, productive sector and instruments for policies and strategy) education is considered at the forefront. Prioritizing education implied a change of perspective in the vision of the ICT for development, which revealed a move from the prior emphasis of access to infra-structure to an evaluation of the learning processes and the educational contents which matched the digital education experiences in the region such as the *Plan Ceibal* in Uruguay, which will be examined further on.

The eLAC 2015, which is the third phase of this regional action plan, proposes eight areas of activity related to ICT in the subjects of access, electronic government, environment, social security, productive development and innovation, enabling environment, education and institutionalism for a State policy. In education it defines developing ICT for inclusive education, that implies that all the educational centres must be connected to the Internet and must be able to develop interactive applications and the production of public multi-media contents⁴.

All these regional initiatives started being systematically monitored by the Observatory for the Information Society in Latin America and the Caribbean (OSILAC), created in 2003 by the CEPAL along with the Institute for Connectivity in the Americas (ICA) of the International Centre for Research and Development (CIID-IDRC). The creation of OSILAC obeyed the need of

[1] In the year 2003 the First World Summit of the Information Society took place in Geneva, this reinforced a process of higher articulation of the goals of the different stakeholders involved in the ICT agenda of governments, companies, educational centres and civil society. This meeting consolidates the "multistakeholder" of the subjects linked to the ICT and development. [<http://www.itu.int/wsis/index.html>]

[2] The meeting took place in Santiago de Chile in December of 2009.

[3] <http://dirsi.net/node/546>

[4] <http://www.cepal.org/cgi-bin/getProd.asp?xml=/prensa/noticias/comunicados/2/41742/P41742.xml&xsl=/prensa/tpl/p6f.xsl&base=/elac2015/tpl/top-bottom.xsl>

having a powerful organizational mechanism that would be able to back the creation of statistics for measuring ICT in the region, with the aim of diagnosing the digital divide, designing digital inclusion policies and evaluating the progress of computer education in Latin America and the Caribbean.

From its very beginning, the main activities of OSILAC were the promotion of the standardization of statistics with the aim of reinforcing the supervision of ICT policies and projects in Latin America and the Caribbean; the evaluation and analysis of the progress of countries in the region in their search for their development of knowledge and information societies; backing them in their efforts in compiling and analysing statistical data; training and offering technical assistance in the national statistical offices and other official institutions⁵. The work carried out by this Observatory enabled the coordination of actions for the different eLAC programs, as well as obtaining a more uniform diagnosis of the region based on analysis and research on the progress of Information Society indicators in Latin America and the Caribbean⁶.

As well as this, OSILAC has carried out a relevant role – in a joint work with the National Statistics Offices and other members of the “Partnership on Measuring ICT for Development”⁷ –, in the definition and consolidation of key indicators, as well as the promotion of a methodological discussion on the concepts and strategies for collecting information about ICT. OSILAC so far has defined 76 indicators, 23 of these correspond to characterization of population/homes, 20 to the measurement of access and 33 to the use of the ICT in and outside the home. However, when analysing the countries that effectively measure these variables, there is a clear predominance in the identification of those linked to access (owning a computer in the home, access to the Internet, connectivity), beyond those that are related to the user modalities (use of Internet and the computer for education, training, information searching, entertainment, bureaucratic procedures, use of e-mail, search for information of health and educational services; differential uses of Internet and the computer in the home, at work, in public access centres, etcetera). Countries such as Bolivia and Colombia do not register any of the indicators referred to the uses of ICT, while other countries in the region have included this data in their latest home census-polls (Costa Rica in 2008, Brazil in 2008, Panama in 2007, Uruguay and Nicaragua in 2006). Chile and México have been the first in carrying out measurements on differentiated uses of ICT (Mexico in 2000 and Chile in 2001), and even so still almost half of the variables linked to the forms of use are still not taken into account by the national statistical institutes⁸.

However, in spite of these efforts to achieve a regional standardization that enables obtaining definitions for implementing public policies and the possibility of comparative studies, the information needs of the region transcend the indicators that so far have been used. These difficulties obey to several reasons. In the first place, not all the countries have carried out statistical surveys that contemplate ICT, notwithstanding initiatives such as OSILAC, that has consolidated a platform for comparison. In the second place, there are variations in the years in which polls were carried out between the different countries and these vary from country to country. In the third place, the type of ICT that is collected in the polls varies amongst countries. Another distinction is associated with the socio-economic variables, which have also not been totally standardized in the region because the differences between some countries are too wide, such as Chile and Haiti. Lastly, the speed of technological change makes statistics become ob-



[5] Source: <http://www.eclac.org/socinfo/osilac/>
Continuity of this Observatory is in doubt at the time of writing this article due to termination of financing.

[6] Fuente: <http://www.eclac.org/cgi-bin/getprod.asp?xml=/socinfo/noticias/paginas/6/34206/P34206.xml&xsl=/socinfo/tpl/p18f.xsl&base=/socinfo/tpl/top-bottom.xsl>

[7] Corresponds to the appeal by the World Summit on Information Society (CMSI) to measure the information society and includes on an international level the ITU, UNCTAD, OECD, World Bank, the Statistics Institute of the Unesco; in Latin America there is CEPAL, CESPAP, CESPAP, CEPA and Eurostat.

[8] Based on: <http://www.eclac.org/tic/flash/>



solete in a very short time-span (Sunkel 2006)⁹. Therefore, the comparison is more challenging and ongoing.

Additionally, the task of harmonization of information of OSILAC considers data that comes from national home surveys, which fundamentally reveals access and connectivity but not the modalities of use. (Dewan and Riggins 2005). But even those countries that consider the registry of these modalities only carry out a descriptive revelation of the observable aspects of consumption of ICT (who uses it, what they use it for, which are their abilities, competencies and navigational choices, how much time they spend, at what time, etc.), without considering the social representations nor the symbolic aspects of the experience of appropriation that are key to evaluate its influence in the development of cultural, emotional and cognitive of the subjects from the point of view of human development.

The world of computer inequity cannot solely be explained as that of a division between those who have access to new technologies and those that do not. The so called digital divide is shaped in many ways and segmented by inequalities of a different nature, as Castells (2001) correctly states, this is not only constructed from socio-economic disparities but also by ethnic, generational, genre and cultural capital differences. To this we would also add another difference of a symbolic nature: between those who understand and take over its advantages and potentials and those who perceive it to be a quasi magical artefact that, in an illusionary manner, could enable people to avoid a new type of social exclusion which day by day is perceived to be more and more threatening.

The contribution of the qualitative research perspective in the region

Although qualitative studies of the realities of digital inclusion and exclusion in the region have been few, isolated and dispersed, as well as carried out from different methodological points of view, they offer varying perspectives about the experiences of ICT incorporation. On the one hand, they enable the verification of diverse processes of symbolic appropriation in different socio-cultural settings, and on the other, they reveal that the scientific, technological and educational hopes for digital educational programs not always match the socio-cultural expectations of their recipients (Arredondo 2001 and 2005; Aprea 2007; Winocur 2007 and 2010; Urresti 2008; Cabrera Paz, 2001; Lizarazo, 2010).

These investigations have also proved that many of the digital educational programs assume in an explicit or implicit way, that their recipients are a "blank page", where it is possible to inscribe learning diverse abilities to use ICT. In this sense, when obstacles arise in this sort of policies, these are usually attributed to the difficulty they have by poorer users in incorporating new knowledge and abilities, omitting in this way the fact that the incorporation of any new media or communications genre has always been affected by the social representations that each group or social segment has historically constructed with the technology and, in many cases, these can act by easing or hindering by means of acts of resistance or denial, the incorporation of ICT.

These studies of a qualitative nature, also reveal that in the case of families in the same socio-cultural bracket there are different cultural capitals, vital experiences and differentiated circuits for the socialization of ICT, which enable certain types of appropriation and not others. Each domestic space, school and/or community, brings a different meaning to the socio-

[9] In this sense, the Plan Ceibal, which ever since its implementation in 2007 up to its conclusion in 2009 catapulted Uruguay to being the leader in the positions concerning access to Internet making it a paradigmatic case. Nicholas Negroponte is the founder of Media Lab of the MIT. In 2005 he presented the prototype of a computer that will be known as the "one hundred dollar computer" in the World Summit of Computer Information. This is a key element in the project of the organization that he directed at that time, OLPC ("a laptop per child"), which leans out to bring digital learning to all the children in the world. Vid laptop.org

cultural process of appropriation of ICT that is not only determined by the technological possibilities, but rather by the symbolic universe of shared references and practices (Cabrera Paz 2001). These are the symbolic universes, cultural capitals, vital experiences, socialization circuits and different types of appropriation practices, where it is necessary to research with higher precision into the way they form part, intersect and diverge in family and community life.

This short observation indicates that to be able to understand the factors that play a role in the production and reproduction of digital exclusions/inclusions, it is necessary, on the one hand to clarify the cultural and symbolic processes, the imaginary and representative ones that are larger and operate in the construction of inequalities (García Canclini 2004); and on the other, to do research on the initiatives and resources that the excluded sectors have facing these new forms of inequality and exclusion (Reygadas 2009; Filgueira 1999; González de la Rocha 2004; Moser 1998). The above implies that, establishing which is the way in which the beneficiary population makes use of ICT, above all, the less well-off sectors, means not only monitoring access conditions and use modalities and acquisition of abilities, but also the recognition of cultural and experiential imaginaries, which are very often contradictory with the scientific-technological rationality that explicitly or implicitly propose the policies and programs for digital development.

A proposal for qualitative evaluation for the Plan CEIBAL in Uruguay: the most successful digital educational case in the region

Without a doubt, the most successful case for digital education in the region is that of Uruguay which, by means of its Plan CEIBAL (Educational Connectivity of Basic Computer Sciences for Online Teaching for its Spanish acronym), reached the ambitious goal of supplying all the Uruguayan children for State primary school children with a laptop and continues expanding its coverage to reach other educational segments.

In November 2006 Nicholas Negroponte¹⁰ carried out a visit to Uruguay where the main guidelines of what would become the Plan CEIBAL were defined. This became a reality by Presidential decree in April 2007. The project has, as its main goal, the generation of equal conditions for the access of new technologies, transcending the digital divide conceived not only as access to the technology but also all types of conditions that effectively limit its use and appropriation (Martínez *et al.* 2009). The Plan CEIBAL decided to supply all the students and teachers in Uruguayan public schools with personal laptops of the model "XO" (the model manufactured by OLPC) and Internet connectivity. This process started in May 2007, and ended in October of 2009 having achieved the goal of providing all school children with a laptop (Rótulo 2009). At the same time the laptops were handed out, with the immense logistic efforts that this has implied, CEIBAL has developed a teaching process that attempts to generate general educational proposals as well as giving teachers tools to incorporate the use of the computer in the classroom in a meaningful way.

Currently the Plan CEIBAL develops four lines of expansion: the first, towards private schools to enable these students to purchase XO's; the second, towards the pre-school cycle; the third, in secondary education as the primary school students of sixth grade come with their XO's there is an attempt for CEIBAL to have continuity both in connectivity as well



[10] Nicholas Negroponte is the founder of Media Lab of the MIT. In 2005 he presented the prototype of a computer that will be known as the "one hundred dollar computer" in the World Summit of Computer Information. This is a key element in the project of the organization that he directed at that time, OLPC ("a laptop per child"), which leans out to bring digital learning to all the children in the world. *Vid* laptop.org



as in teaching. Finally, it has started to equip handicapped children with laptops jointly with the *Teletón Foundation*. Official figures indicate that in total almost 380.000 XO have been delivered so far of which 371.073 have been distributed in primary schools and 6.000 in secondary schools, private schools and other institutions.

CEIBAL carried out two evaluations of the progress of the plan, a pilot test in 2008 and another in 2009. Both evaluations, which combined quantitative and qualitative strategies, collected and systematized information about the ownership of computers before and after CEIBAL: the ways in which learning took place with the use of the XO; the preferred user choices of children applications and the uses families do of them, the evaluation of students, their teachers, directors and parents about the introduction of computers in their school and everyday lives. Among the chief results of this evaluation are: the Plan CEIBAL notable increases the presence of computers and Internet access in homes with a low social-economic status, the social value granted to the use of computers is mostly positive; the children train with their peers and most teach others how to use a computer above all, their parents; the plan tends to strike a balance between children in rural areas and cities in their digital development, as well as children in favored sectors as well as those in less advantaged sectors; the older siblings are the main family users followed by the mothers, the family uses the XO mainly for entertainment and searching for information; CEIBAL reduces the time that many children spend in front of the television and does not significantly alter their behavior with other children and generates motivation to go to school, above all in the lower socio-economic sectors. They also point out that the general social perception of the Plan is favorable, although it presents challenges: the incapacity of many parents to participate with their children in learning and supervising their explorations; the exclusive use by some of the children of some of the entertainment functions and the need to create a system of back up XOs in the schools to reduce eventual breakdowns, which are more frequent in less favorable socio-economic sectors (Martínez *et al.* 2009).

The achievements of the *Plan CEIBAL* are indisputable. The challenges are also unquestionable in the next phases towards the promotion of a full digital inclusion, above all in populations with less resources and the use of ICTs with a meaning, that is, "take over the potential benefits of the innovations to use them in solving daily-life problems as of self made judgements on their convenience" (Martínez *et al.* 2009). Yet, as happens with the rest of the evaluations of programs for digital inclusion in the region, statistics and research document the material access conditions, the abilities and competencies obtained inside and outside the classroom and the evaluation of the experience by the children, teachers, mothers and fathers have been the most privileged elements when measurements were done. Evaluations done in 2008 and 2009, state as a serious limitation to their conclusions, the fact that no in-depth study has been done on the use experience and socialization of the XO in beneficiary families and their communitarian areas: "The Plan CEIBAL is an ongoing policy and as such has not generated a single response to the demands of its users, but rather several ones, adapted to the times and spaces it has been developed in. (...) In this case, the investigation of the perception of an individual on an aspect of his or her experience, implies foreseeing which has been his or her possibility of experience on this aspect. These difficulties have been weighed in the analysis of the information and eventually, have lead to exclude

from this report considerations and conclusions that can be significant but merit more study" (Martínez *et al.* 2009).

To be able to deal with the limitations pointed out in available evaluations and with respect to the following phases and challenges that the Plan CEIBAL must address, as well as other digital educational programs in the region, we consider fundamental on the one hand to do research on the socio-cultural conditions and the experiences of appropriation of ICT in families from a socio-anthropological point of view, which recovers the subject's viewpoint in the definition of his or her own realities and needs. Another research line is to identify the ways in which ICT are represented and experienced by social actors, the imaginary elements and inclusion strategies they develop with them and recognize the shortcomings of the intersections between policy inscription and the symbolic universes where the imaginary elements of the families in the lower socio-economic groups have of them. For this purpose it seems relevant to deal with the following research and analysis dimensions:

1. Investigate the relationship of the families with the processes of digital exclusion/inclusion, attribution of meanings, interpretations, conflicts, difficulties and assimilations with regards to digital elements.
2. Analyze the social representations which operate in these families' imaginaries which are attributed to the operation, possibilities, advantages and disadvantages of ICT, particularly with the use of the XO laptop computer.
3. Establish how these representations have an influence in the incorporation of ICT in the home, the relationship with the school, social inclusion strategies, creative solution of problems in the community and visibility in the social sphere.
4. Observe and re-build family dynamics and communitarian use, appropriation and socialization of ICT.
5. Confront scientific and technological rationality of policies of digital inclusion with the imaginary elements and experiences of incorporation of the ICT in families designated of these policies.

At the same time, the evaluation strategy proposed, assumes that in the domestic areas, family and community (with their articulation processes, intersection and divergence), as well as their relationship with the school, are key in understanding the appropriation of ICT. The home and community establish a fundamental mediation with a practical nature, affective and symbolic character in the appropriation of the ICT. They constitute a web of domestic, local routines and media connections, family ties and virtual networks, closures and openings that are on line and *offline*, disagreements and alliances towards the control of "new" and "old media", of encounters and distances in virtual space and real space, projection towards public elements and back tracking towards intimate elements and tension between individual projects, family traditions and community traditions (Winocur 2009: 17).

As well as this, it is basic to understand that the family is not the aggregate sum of consumptions and individual practices of its members, but ra-





ther a constitutive environment with meaning pierced through with logics of power, genre and generational differences:

“The relations that define it, the myths, stories and values that uphold it, the conflicts or crisis that threaten it, offer one of the basic social environments in which individuals deal on a daily basis with the problems of daily living. Thus when the consumption of media is done in the family, this takes place in a complex social situation in which expression is done of (through the diverse sub-systems of marital relationships, parents or sibling relations and through the relations the family members maintain between each other and with the external world) different patterns of cohesion and separation, authority and obeisance, freedom and constraint” (Silverstone 1996: 64).

Finally, it is necessary to consider that the home and the community are also key settings of cross tensions and negotiations of logics of genre and diverse generational experiences, community traditions and political and social participation trajectories that generally are not taken into account when it comes to evaluating the impact of any public policy and not only that of digital inclusion. For example, the bibliography on generational differences in uses and appropriations of ICT has privileged the analysis of the phenomenon from a comparative point of view, yet isolating the experience of one generation with regards to the other. They are also not thought out to be spaces for negotiation and conflict, which is where these differences are construed and become legitimised as pertaining to each social, cultural, genre or generational segment (Winocur 2009: 18).

To conclude

Within the general and dominant setting of the policies for evaluating programs for digital inclusion in the region in the government agendas, priority has not yet been provided for research on the experiences of daily appropriation of new technologies in diverse socio-cultural realities. With this we do not claim to state that there is no concern about the conditions of ICT incorporation, but rather that the concern is focalized in the diagnosis – generally quantitative – of the extension and segmentation of the so called “digital divide”, in counting up the access and register of user modalities.

In the sense revealed earlier, concern for monitoring and evaluation of policies for digital inclusion and programs for computer education, are marked as indicated above, by a series of explicit or implicit elements that make evident the difficulty in incorporating in their diagnosis the inquiry into the experience of appropriation of the individuals and their families in the different socio-cultural realities. This systematic omission makes obvious a limitation which has an epistemological root which is expressed in the design of the evaluations and construction of the indicators. These do not contemplate the recovery of the perspective of subjects for the evaluation of the progress of the programs they are the object of.

The basic premise of the evaluation strategy proposed is the recovery of the subjects’ perspective in the definition, understanding and interpretation of their actions and expectations within the symbolic universes they belong to. From this point of view, the results obtained will enable, in the first place, to generate a much deeper insight removed from prejudice and

suppositions of those who design the policies and programs about the diverse realities of incorporation of ICT. In the second place, to elaborate qualitative indicators that encompass the experiences of use and socialization of the recipient families and their localities. Lastly, to develop a methodology for the reconstruction of the appropriation process of ICT that is valid not only for future evaluations of the Plan CEIBAL, but also following other plans, programs and policies for digital inclusion in the region.

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