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Deciphering LeLa's Code: Digging in the significance of the Internet for the ICT access, uses and desires of women technologists

Abstract

Research on gender and technology has traditionally focused on studying the exclusion of women in ICT. In contrast, technologist women's experiences and their strategies leading to their inclusion in ICT have received less attention. Motivated by our previous experience in technoactivism and the observation of a remarkable presence of women, within the *Donestech Collective*, we initiated a research project on the access, uses of and desires of women who had been involved in technology. For this we created a website, gathered information on women and technology, generated and participated in meetings and workshops and, especially, collected experiences of women technologists. A call was made through the Internet to answer a semi-qualitative questionnaire online and, besides that, several in-depth interviews and focus groups were conducted in different Spanish Regions. Our findings suggest a great diversity of women pathways to ICT as well as heterogeneous technological practices among women technologists where Internet plays a significant role. Moreover, our results show that women in ICT are curious and enthusiastic, want to be empowered, are willing to share the knowledge gained with others, distrust and dislike power relations existing in the technological environments and try to maintain a critical and creative attitude towards technology.

Keywords: technology, ICT, gender, learning, desires, e-Inclusion, Internet, activist research, feminisms, cyberfeminism, Donestech

Introduction

In the 90s, the feminist theory of technology experienced a renewed optimism with the rise of ICT and the development of the "third-wave feminism". Departing from the potential of new technologies, in particular Internet, for the transformation of society and women, feminism is loaded with assurance through a practical and theoretical renovation supporting the participation of women in technology encouraged by its opportunities for gender transformation (Haraway, 1991; Plant, 1997; Wajcman, 2006; Sveningsen and Sunden, 2007; Landstrom, 2007, among others). This research criticizes gender inequalities, and emphasizes on the possibilities for women participation through ICT in order to overcome these disparities. This potential for transformation lies in the

provision of new possibilities for appropriation by women of these new technologies underlining their horizontal development processes (Hawthorne and Klein, 1999; Nuñez and Garcia, 2009) the production of new spaces to occupy like cyberspace (Flanagan and Booth, 2002; Sveningsen and Sunden, 2007), and, above all, the power to de-construct predetermined categories and binaries applying to gender (Haraway, 1991; Landstrom, 2007) and upon the interpretation of what stands for technology (Lerman et al, 2003; Wacjman, 2006).

However, research focusing on the analysis of the presence of women in ICT has tended to concentrate on mechanisms explaining their exclusion from ICT (Cohoon and Aspray, 2006; Castaño, 2008). Experiences and strategies of women technologists to enter technological fields have received less attention. As noted by several researchers (Sorensen, 2002; Lagesen, 2007, Faulkner and Lie, 2007), there is a need for a more in-depth understanding of current mechanisms of inclusion. This brought our collective of women and new technologies, Donestech (Dones is the Catalan word for Women and tech refers to technology), to be specifically interested by processes of inclusion (e-Inclusion and social inclusion with ICT) and the understanding of pathways for learning developed by women who already accede, use and/or develop technologies.

For instance, part of feminist literature of technology has identified certain motivations that trigger the interest of women for technologies. This can be summarized, according to Sorensen (2002), as "duty", expressing an utilitarian motivation, and "love", expressing an enthusiastic motivation. Interestingly, feminist literature suggests "duty" as the first motivation attributed to women while "love" is attributed to men. Accordingly this gender distribution of motivations denies and renders the experiences of access to technologies by women, driven by enthusiasm, invisible (Sorensen, 2002; Lagesen, 2008).

Previous literature related to gender e-Inclusion has already identified a number of auspicious factors facilitating the entrance and immersion of women in technology (Margolis and Fisher, 2001; Sorensen, 2002; Lagesen, 2007, 2008, Faulkner and Lie, 2007). In summary, the first factor identifies the importance of a context that is potentially (or is perceived as) women friendly. In this regard, the existence of tools, spaces and contents of interest and/or useful for women is a necessity (this is the second factor). Thirdly, as with any other type of learning dynamics, there is a need for available training resources and access to information. Fourthly, infrastructures and facilities to access ICT (e.g. broadband, computers, other devices) are still very much relevant pointing therefore at the importance of policies to develop e-Inclusion initiatives targeting the entrance and use of information and knowledge societies by all, anywhere and anytime. Fifth, the existence of role models and other mentoring, tutoring and support mechanisms is important. It can be achieved either by shedding light on the role of women in the development of sciences and technologies, or by enabling mechanisms, spaces and groups aiming at transferring their knowledge on ICT issues to their peers. Finally, the perception by women of career prospects and employment opportunities related to ICT is highly relevant. Thus, taking into account these elements constitutes a pre-requisite to enable the access and inclusion of women into technologies, inasmuch as it empowers them to become more deeply involved by participating also into ICT design and development from an active, critical and emancipatory perspective.

Cyberfeminist activist research

Motivated by our own technoactivist experiences and the observation of a significant presence of women in these areas of participation in 2006 within the Donestech collective, we began a process of activist research regarding the access, uses and desires of women already involved in technology. Our purpose was to offer new platforms of expression and analysis of their experiences and views, while we intended to decipher "lela's code" about why and how women participate in technologies, investigating which desires were expressed regarding both technologies and (the women) themselves. We wondered about why women acceded to technologies, through which pathways, enablers, tools, and which type of tactics they were developing to address or overcome limiting

conditions and be able to build a relationship with technologies. All this to make visible the specificities of women in ICT, enhance access of women to technology, consider the relationships of women with ICT and ourselves, continue creating networks and incorporating technologies in our research and in our technoactivist practices. As stated in our manifesto, we have been entangled, more and more and more ... so the LeLa's Code Project, has become a megaproject related to and that relates women with technology.

Our cyberfeminist activist research is based on an intensive use and practice with ICT which intends through the production of critical knowledge, creative action, social and techno artivism to generate political and social gender transformations from a dynamic, fluid, heterogeneous and performative perspective (Vergés et al, 2009). In order to do so, we created a website (www.donestech.net), collected information, generated and participated in meetings, workshops, training and, we focused in mapping, identifying, compiling, analysing and communicating experiences and views of women technologists who generously lent their time to share their experiences with us. Although we were initially based in Barcelona, Donestech collective increasingly became highly present in the cyberspace and its members increasingly became nomads. Therefore we tend to collect and disseminate information in different languages such as Catalan, Spanish, English and French.

Specifically, in 2007 an open call was made, simulating the snowball technique via specialized mailing lists, specific groups related to women and ICT and the Internet to respond to a semi-qualitative on-line survey. In parallel, between 2007 and 2008, we also conducted multiple face-to-face interviews and discussion groups. Although we iniciated our research in our Catalan context, soon we extended it to the Spanish context with some international insights (Donestech, 2008). Knowledge presented in this article is based on 302 online surveys (78% of them residents in the Spanish State), over 60 in-depth interviews of women technologists carried out in Barcelona and in technology related international events and four focus groups with women technologists carried out in three different Spanish Regions: Andalusia, Catalonia and Madrid. Collection, analysis and dissemination was developed through a three-pronged approach based on content analysis, an intense use of technologies connected to cyberfeminist practices and transdisciplinarity. Thus, various disciplines such as sociology, statistics, computer sciences, interactive visualizations, multimedia, audiovisual production and artivism have been involved.

Internet as a powerful enabler for the access, uses and desires of women technologists

Our research did not start from rigid or predetermined definitions of women and technology, in order to avoid to fall into a predefined and specific universe of women technologists. Women participating in our research consider themselves as advanced users of ICT and because of this shared experience they tended to define themselves as women technologists.

On one side, profiles proved to be diverse and heterogeneous among advanced users, creators and developers of ICT involved. On the other side, our statistic and content analysis of the surveyed sample brought a set of predominant socio-economic characteristics to light. The latter consists in relatively young women, living in big cities, college educated, gainfully employed with an upper-middle social position even tough their financial earnings are more or less in the one thousand Euros monthly range . Mostly they are single with a partner, usually without persons at charge or dependants and with some free time to spend. Those elements imply that the development of e-Inclusion strategies should take into account, besides the gender factor, socio-demographic and socio-economic inequalities caused by place of origin, class and age. Needless to say, elderly, immigrants, ethnics minorities, residents of rural and deprived areas, uneducated or low income women can be doubly excluded in their possibility to accede, use and develop technologies.

Also, a gap in time can be noted regarding the first memory of contact with technology and more advanced and conscious technological immersion. Conscious immersion generally takes place many

years after first contact. First experiences with ICT are related, by order of relevance, to: formative experiences, use and appropriation of various ICT devices, using Internet, performing tasks with specific programs, and finally gaming as well as development and experiences of use of ICT within activism. In relation to many first experiences Internet plays a significant role, either because of its meaning in regard to information search capabilities, either for its communicational aspects through the creation of a first e-mail or first time use of e-mail, chat and equivalents. For instance a women graduated in Wellness Management Systems told us: *"My first access was to use Internet and creating my first email account".*

Motivations behind this first access bear upon curiosity, passion for technology, but also training and employment needs. Thus the view that motivations of women based on enthusiasm should be (re)considered and enhanced in order to promote the access to ICT by many others is confirmed by our research. Moreover, one motivation can easily lead to another, as shown by the testimony of this Web developer and expert in digital marketing: *"At the beginning I used it for office applications and labour issues, then I used Internet for fun and fascination".*

Factors that have made their access to ICT possible are, in order of relevance though often overlapping with each other, first through training and work, and then because of a financial wellness to purchase connection and ICT household, third a socio-affective environment related to or motivated by technologies, fourth the existence of the Internet and its communicational opportunities, and, finally, other elements such as having free time or having personal and professional requirements to use ICT. Thus, Internet is again felt as a key enabling factor for the access of women to technology. In that regard, a journalist and film-maker told us that:*" Having a computer at home and Internet at a very young age, and the fact of studying Communication and constantly the need to use computers, manuals, video editing, layout tools [enabled her to access technology]"*

In terms of access and production of knowledge in order to learn how to use and/or develop ICT, women technologists combine different approaches, again generally activated simultaneously, but in which the autodidact way predominates combined - or not - with formal training. If we look at formal academic courses, almost half of the participants didn't pursue scientific and/or technical studies, but rather social sciences or humanities. Furthermore, women with a disciplinary scientific-technical background show an equally pronounced split between different disciplines. Autodidact pathways of learning, whether or not combined with courses, are again marked by the presence of the Internet. Women learn through forums and online communities, they search and download information via the Internet (texts and audio-visual contents) and they develop an extensive communication with their referential social networks on the Internet. As shown by the testimony of a photographer, video and radio producer: *"I am an autodidact, as also are my friends which have given me tips, I go also to Internet discussion forums when it comes to software, buy books and in general ask a lot of questions".*

With regard to uses, our sample shows a great level of diversity in working and in the area of technological applications. Women technologists develop anything from website to hardware devices, build art installations, manage and administer databases and servers, analyse computer processes, produce electronic music, audiovisual, podcasts. They teach and train ICT, provide help and develop How to's, documentation and manuals. They write posts, blogs and e-poetry and they sew and wash clothes with domestic appliances. Less commonly encountered occupations might relate to hardware maintenance, network administration and security issues. Also noteworthy is the use and knowledge of free software, especially by creators and developers of ICT. Once again Internet plays and important role as enabler of knowledge processes making possible to find, download and test applications, accede to learning spaces and other areas for communication, documentation and socializing surrounding communities of development of Free Software.

Women technologists' interest in learning about and disseminating free software and free applications can be also highlighted and interpreted as a mean for gender transformation. This fact

is particularly interesting because of stereotypes stating that women are not (interested) in free software and thus contributing to its transforming potential. As told to us by a digital artist:*"That's why we need free software, in French operating system is called "système d'exploitation", then I suppose that owning your proper operating/exploitation system is the minimum, and change it as you want is the least of the minimum. Also the idea of sharing and exchanging together is powerful. There are no copies, everyone has the original, the possibility of sharing the same things is important".*

In addition, our analysis shows that technological practice is not as solitary and asocial as is commonly believed. In this sense Internet plays a crucial role not only as a repository for documentation, but also as a space of communication and interaction for lifelong learning, inasmuch as it is a place where to develop new electronic identities, social capital and networks of support, solidarity and friendship. A topographical engineer expressed it thus: *"Exchange of geomatic information with other departments just works fine. In my private life I am a regular user of Internet forums as a source of information and knowledge and exchange with peers."*

Women technologists are also critical with current ICT development and have expressed individual and collective needs and desires of improvement. For instance, almost all women surveyed aim at learning more and being able to do more (things) with technology. Among them, once again, tasks and skills closely related to Internet such as improving knowledge for Web development, transmission of contents over the Internet or information management are clearly pointed out at as priorities. As a high school teacher expressed it: *"I want more choice of video creation tools, image and web and I want to be introduced to radio on Internet and participate to joint projects that can be disseminated over the Internet".*

But they also want to improve their learning and practices in order to develop them in better conditions. Internet is seen as a necessary means to create and maintain areas of content creation, sharing and networking. In this sense women recognize its potential for social and gender transformation by improving conditions of access and use. Therefore they demand technologies and an Internet designed to be accessible, shaped by flows of free knowledge and information, with more security and more autonomy and of course remaining economically suitable and sustainable. This was expressed by a statistical computing engineer: *"Regarding barriers of access, phone companies and Internet Service Providers should be more controlled and provide better service in Spain where it is still very expensive".*

Finally, women technologists want better working conditions and better distribution of time facilities. In general, they claim against existent gender discrimination, especially gender stereotypes that suggest that women are misplaced or exotic freaks in the domain of ICT. This was underlined by a student in Industrial Engineering: *"I wish people didn't look surprised when you're a girl and say that you are also a student of electronics, and a computer-geek …"*

Conclusions

Women technologists access and use technologies in many and diverse ways. Practices and immersion with ICT provide from non linear trajectories where Internet plays an important role as an enabler and facilitator. The analysis of women technologists' experiences and views underlines the importance that should be paid to non formal and informal pathways, as enablers to enthusiast motivations for the access and gaining of knowledge by women on ICT. The heterogeneity and fluidity of practices invested also resonates with the variety of sociabilities taking place currently inside the so called "technological field", analysis of the latter points at the persistence of gender discriminations. Therefore in order to overcome those more research is needed, as well as policies enabling the activation of interests and concerns to acquire further ICT skills by women, the recognition of the potential and central role of the Internet and ICTs for gender and social transformation and, finally, the need for inclusive measures should be addressed, geared towards the

multidimensional aspects of the relationship between gender and technologies.

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