EDULEARN 13

5TH INTERNATIONAL CONFERENCE ON EDUCATION AND NEW LEARNING TECHNOLOGIES

BARCELONA (SPAIN)
JULY 1ST, 2ND AND 3RD, 2013

CONFERENCE PROCEEDINGS

IV. 8
(✳ 3)

GENDER DIGITAL DIVIDE AND ENGINEERING STUDENTS

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Abstract

Although each day especially the new generations of young people and children have increased access and use several digital technologies of communication and information such as cell phones with various apps, tablets, internet, computers.... But still persist the "negative images", prejudices and stereotypes regarding women have less use of those devices, fear of technology, lack of expertise, and / or waste of time, while the male stereotype indicates a higher use of computers and high skill with these technologies, especially for work.

At the level of higher education, particularly engineering students in high technology, we observe the current generations of digital device users make extensive use of digital technologies. Clearly the need to use certain equipment and software a result of their professional training enables almost equally to men and women in those skills, but the question would be is the educational background that allows the disappearance of digital divide or the reason of differences is because of gender?

To help answer this question, in this paper, we present the results of a gender perspective research being done at the National Polytechnic Institute (Mexico) particularly at UPIITA School, where they train students in Engineering and Technology advanced. Thus we can identify if there are significant gender differences in the use and appropriation of technology primarily for educational purposes vs. social networks primarily for interpersonal communication and entertainment.

We should mention that we start from the idea that technological appropriation cannot be the exclusive result of a single factor could be decisive as access to technology or age or educational context. We therefore consider doing this study with students with similar characteristics (such as age, career interests, etc.), to identify if gender is the cause that makes the difference in the use and appropriation of technology.

Keywords: Gender, technologies, engineering students.

1 GENERAL BACKGROUND

The introduction of computers from the 90s of the twentieth century marked the beginning of an increased potential for various digital technologies not only the business sector but to everyday life, most if these technologies can be interconnected through the Internet nowadays and thereby generate several new features now in cyberspace.

From this context, we can no longer glimpse a world without these technologies, which invites us to think about the rules and / or policies of use, its advantages and disadvantages that they bring, international policies to provide citizens with compliance of equal rights for use, even ethical and research issues. Therefore, the introduction of these technologies can not be a matter casuistry, but planned and analyzed and even considering a prospective, before an exponential progress of technology development.

Educational institutions should incorporate or incorporate this logic related to scientific and technological training of students. At the present time no one could think professional formation without a vision of incorporating technology, this in all degrees, but particularly those disciplines in which technologies have become an essential part of development, such as the Engineering .

It is therefore important to know how young people appropriate technology and study the participation of higher education institutions in the process of technological appropriation.

The process of appropriation begins with people trying out a technology that hadn't previously belonged to that person (Rogoff, 1995), in this process the technology will adapt to the shape to their individual's or the group's needs and then convert it an integral part of their lives. The technology appropriation is different to mastering a tool, but with time, participants become more and more proficient in the use of a set of tools in the context of a social practice.

Javier Echevarría explains:

> An inclusive information society, in the sense advocated by the Declaration of the UN World Summit, requires that any person has an area of skills related to Information and Communication Technologies (ICT) sufficiently large, for which there sufficient tools or instruments. The essential thing is to know to use them, and this requires training. So appropriation of ICT is a prerequisite for no exclusion in information societies. [1]

ICT, including the Internet not only provides new forms of information and communication, it configures a new social space, a space telematics, digital and reticular. It is important to consider that these new configuration will take place not only in certain social groups, but in a certain socio-cultural space, generating appropriation differences between one country and another, between one region and another, between one community and another.

> The emergence of electronic space leads to the appearance of a new form of writing and publishing, electronic documents, based on digitization, computerization, hypertextualization, the telematics and electronic storage media. It is important to consider that ICT not only transform what is published (eg on the World Wide Web), but also speech and writing intimate and private (chat, email, personal files, blogs, SMS, firm electronics, encryption, authentication, etc.). As more expand in the private, the greater the social appropriation of ICT. [2]

1.1 Some Studies of Women and ICT

As mentioned above, the socio-cultural context is important, but also the characteristics of individuals, such as economic class, their level of education, age.... and of course, gender. It is important to contextualize all these elements, not to confuse the conclusions that can be reached. So below we will mention one of many studies that take into account the context multifactorial analysis of technological appropriation.

> Young women (up to 25) mostly had an almost "natural" with ICTs in the words of Rosi Braidotti (2001) [3] were almost as an extension of their bodies, not imagine life without them. What's more, most do not remember how they had learned - "One day I sat down at the computer and started playing some keys and looked at my brother and play" Marina, 18 years. Those who belonged to medium adult generations (of 26-40 years) had gained access to email and the Internet and the management of some programs such as Word and Excel and they had reached before the "needs required" to stay in the labor market, in sales jobs (telemarketers) and social management plans. Both activities, although precarious were / are one of the few employment opportunities for the / o youths and women from popular sectors even in the midst of economic and social crisis of the early 2000s. [4]

Due to the variety of factors that can influence technological appropriation, has been selected to the Interdisciplinary Professional Unit Engineering and Advanced Technologies (UPIITA) belonging to the National Polytechnic Institute, the bachelor are Mechatronic Engineering, Telematics Engineering and Engineering Bionics, degrees requiring a high use of ICT, which allows us to study the presence or absence of stereotype use of ICT and gender, who use or require the use, what they use, and habits and level of ownership.

2 METHODOLOGY

We use quantitative and qualitative methodology. The quantitative methodology was a questionnaire that includes questions closed, open and rating scales. Qualitative methodology included in-depth interviews to understand in more detail the phenomenon.

Questionnaires were administered to a representative population, specifically the proportional stratified sample because it allows the selection of subjects stratification based on criteria such as gender, occupation, degree. In the qualitative stage instrument we used depth interviews that allowed us to access and understand the experiences in the technology approach, preferences and comparatively appropriation by gender. Once developed this diagnosis, analyze the results, make proposals and through publications information socialize.

Qualitative methodology seeks not unlike quantitative statistical representativeness, but to contribute to deepening the understanding of the subject matter.

3   RESULTS

Below are the results representative: 205 questionnaires were applied (representing 10% of the current population UPIITA), providing the following Fig. No. 1. –
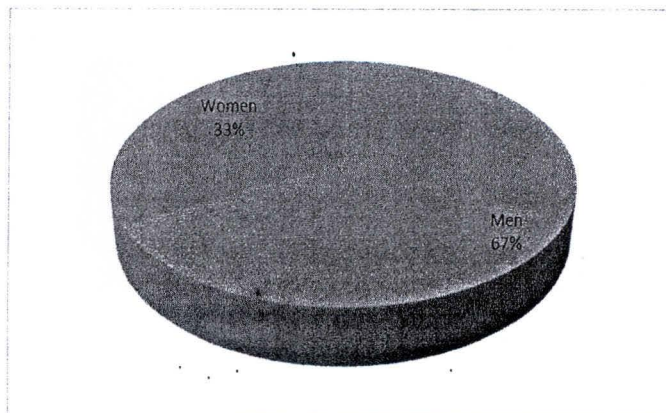

Fig. No. 1. - Percentage of students (women and men) participants in the questionnaire.
(Representative to the total percentage of UPIITA).

When asked to the students about the use of technology is important and significant to note that in UPIITA not seen a big difference on the basis of gender in the ACCESS to certain technologies such as: computers, laptop, MP3, phone, scanner, Internet service. (Present only most representative graphs, Fig. 2, Fig. 4).
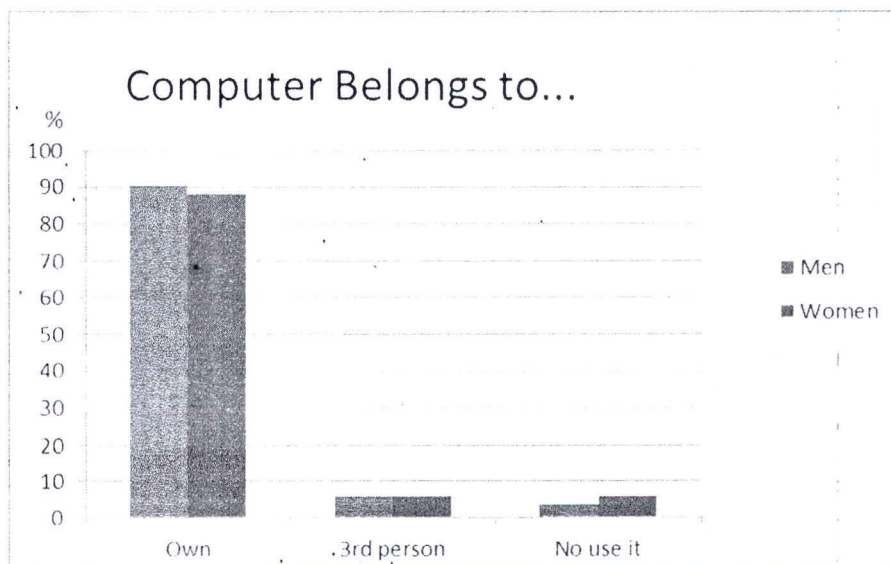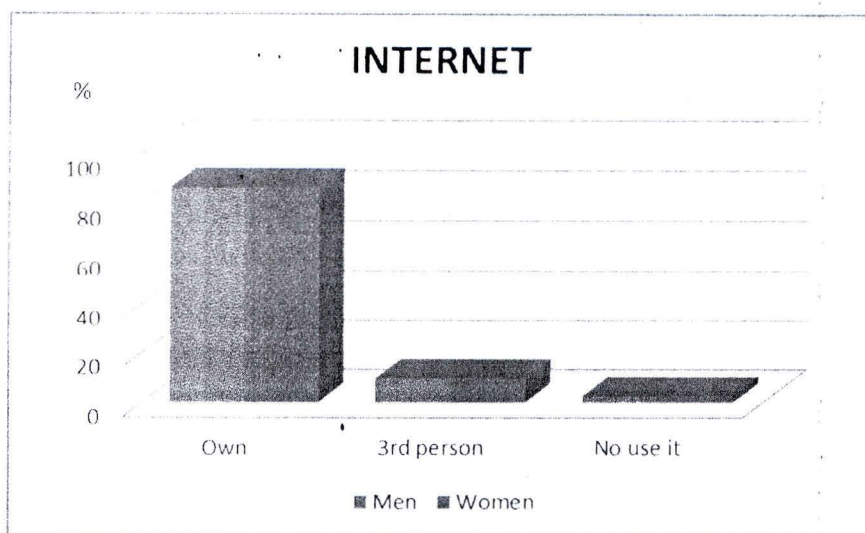

Fig. No. 2.

INTERNET

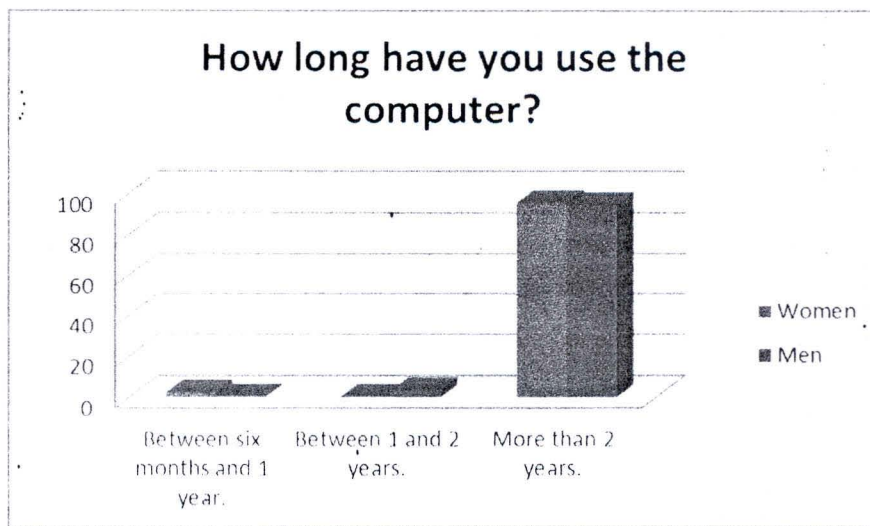Fig. No. 3.

How long have you use the computer?

Fig. No. 4.

As seen in the previous graphs not detect significant differences in access to technologies by gender. It is important to emphasize that UPIITA, being a school of Advanced Technology Engineering, required for such technologies, so that at no time is to generalize these features to any other school UPIITA even among all schools in the IPN. (Fig. 5).
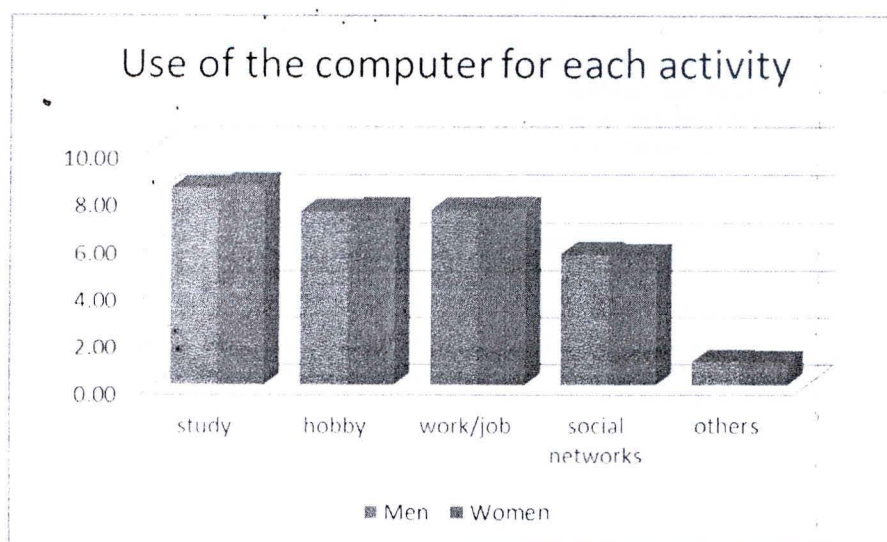
Use of the computer for each activity

Fig. No. 5

Now, was observed access to such technologies, equipment and access is only the first step, it is necessary to develop skills to generate a true appropriation which together can contribute to the construction of their identity outside the parameters sexist and transforming symbolic forms of power. This is where differences were found.

Some examples of this occurred when asked about:

• Know the elements of the computer, its main peripherals and basic maintenance?

While male students are considered good management of anterior aspect (62% claiming to have such powers), women (46%) describe themselves have this same competition. That is, we observe a difference greater than 15 percentage points.

Also observed gender differences, as they relate to technical and maintenance skills, (see fig. 6).
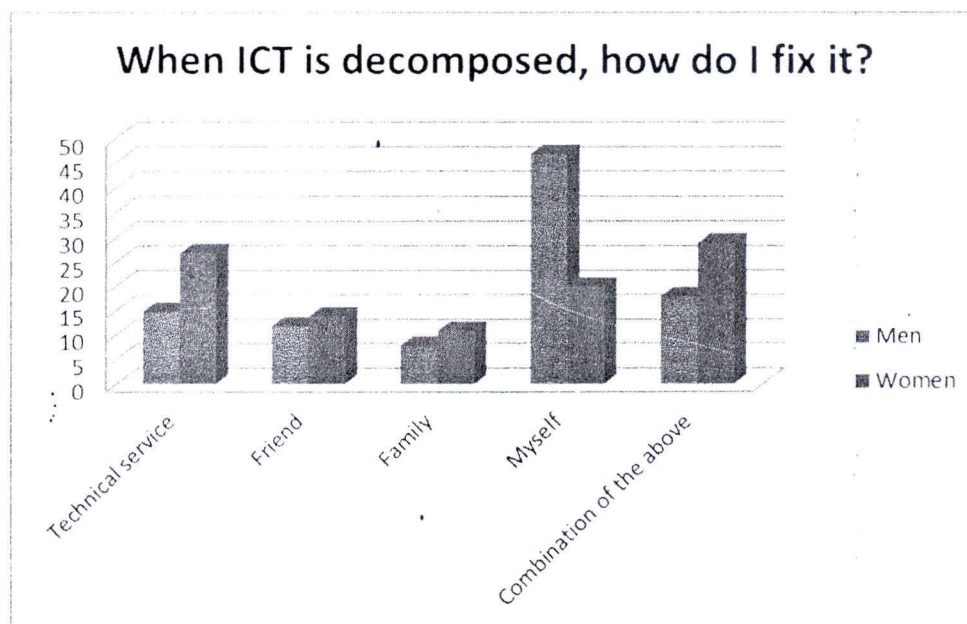
When ICT is decomposed, how do I fix it?

Fig. No. 6

4   MAIN CONCLUSIONS

A man and a woman in high technology engineers should have these skills (regardless of gender, prejudices) and especially if we want the IPN is at the forefront of these international goals. Information Society that takes into account the gender dimension will be an incomplete, while ignoring the mixed results that technologies have for men and women. To enable women to participate in the advantages and benefits of the information society, it is vital to integrate gender perspectives in all aspects of development, not only in their access.

The use of ICT by the population has become an essential component of economic and social welfare. From the engineering perspective, it is even more important.

Although we observed a high access to technology by both men and women, there are some differences by cultural issues, self-esteem and skills developed, which generate differences in the use and appropriation of these technologies between men and women, by it is concluded on the need to develop those skills detected (not capacity) to equal appropriation technology.

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