INTERNATIONAL JOURNAL OF EDUCATIONAL RESEARCH AND INNOVATION

REVISTA INTERNACIONAL DE INVESTIGACIÓN E INNOVACIÓN EDUCATIVA

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Las herramientas informáticas que utilizan los docentes de la Unidad Educativa Ibarra

The computer devices and applications used by teachers of the Ibarra Educational Unit

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RESUMEN.
Este artículo permite conocer la frecuencia y beneficios de la utilización de las herramientas informáticas por parte de los docentes de la Unidad Educativa Ibarra en el año lectivo 2019-2020. En esta investigación mixta se utilizó un método descriptivo, se aplicó un cuestionario en línea a toda la población (71 mujeres y 41 hombres). Del análisis realizado se determina que la totalidad de los docentes encuestados han incorporado en diferente medida el uso de dispositivos y aplicaciones tecnológicas en sus actividades diarias. Se observa que solo el 5,36% de los encuetados consideran que tienen un nivel avanzado, mientras que un 20,54% tienen suficientes conocimientos en este campo. Las aplicaciones más utilizadas por los maestros son: sistema operativo, internet básico, correo electrónico y programas ofimáticos. Se concluye que los profesores por sus medios han incorporado parcialmente estas herramientas en sus actividades pedagógicas y administrativas; no obstante, es de vital importancia que las autoridades viabilicen nuevas formas de actualización y perfeccionamiento docente, de esta manera se contribuya al aseguramiento de la calidad educativa.

PALABRAS CLAVE.
Dispositivos, Aplicaciones, Docentes, Tecnologías de la Información y Comunicación, Unidad Educativa Ibarra.

ABSTRACT.
This article assesses the use and benefits of computer tools by teachers of the Ibarra Educational Unit during the school year 2019-2020. In this mixed research work using a descriptive method, an online questionnaire was submitted to the population made of 71 women and 41 men. Based on the analysis, it is established that all of the teachers questioned have integrated technology in their daily activities. Their use of computer devices and applications differ though. It is observed in the survey that only 5.36% of teachers consider

their proficiency of technology as advanced, while 20.54% consider their knowledge as sufficient. Operating system, basic internet, e-mail and office software are the most common applications used by teachers. In conclusion, it can be said that teachers have partially incorporated these tools in their pedagogical and administrative activities. However, deciders must absolutely support teachers training in order to improve their teaching skills and contribute to the quality assurance of education.

KEY WORDS.
Electronic devices, Applications, Teachers, Information and Communication Technologies, Ibarra Educational Unit.

1. Introduction.
Worldwide, the teaching and learning process has dramatically been changed by the necessary integration of information and Communication technologies (ICT) in the classroom, especially in the areas of planning, presentation, exposition, communication and evaluation. For Oteiza (2015) ICT has already impacted all areas and it allows us to benefit instantly and interactively from a large amount of information and work resources at our fingertips. Area, Hernández and Sosa (2016) argue that "since 2006, the use of IT have not increased as expected, rather, it has been stable since then.

Internet is a library with an infinite amount of information in every field that is available to everyone". In the last two decades, in education, teachers have been using it as a source of consultation, especially in the research field. According to Laitón, Gómez, Sarmiento and Mejía (2017) there is still a long way to go before ICT is fully integrated in schools and becomes a support in the teaching-learning process.

Since the early 1990s, both central and regional education officials have wondered how they could implement the use of computers in schools. In Ecuador, during the last three decades, different programs have been implemented to encourage the educational use of ICT. According to a publication by ProEcuador, (2019) in 2015, 50.5% of the Ecuadorian population used the Internet, reporting a 35% growth in 2019. This rise was the result of the deployment of submarine cables. There is no doubt that this technology leap has favored productivity, communication and competitiveness gains in all areas of development.

Most educational institutions in the province of Imbabura, Ecuador, do not enjoy yet a proper infrastructure as their internet access is very limited and their teaching staff is poorly motivated. However, there is a lot of desire from teachers at all levels of education to correctly integrate technological tools in their classrooms.

The situation of the urban educational institutions within the province is quite similar. Their infrastructure is not up to date and generally not strong enough for educational purposes. The Ministry of Education provided teachers at the Ibarra Educational Unit (UEIbarra) with a laptop computer which is used for different activities, such as research activities, grade recording, and class planning. However, in the educational field, new computer applications are not used extensively in and out of the classroom. It is not surprising to find words such as "new information technology" and "didactic innovation" in the same sentence. After all, the

introduction of computers in the curriculum has been pushed for about three decades (Romero, 2014).

To get back to the subject of this research, the Ibarra Educational Unit seeks to remain a leading institution by developing innovative solutions for teachers and students but also by upgrading the current channels of communication between all members of the community. This article studies how the teachers of this institution are implementing the main educational technological tools in the teaching-learning process. More specifically, this work aims to identify the devices and computer applications that are most frequently used and the ways in which these technological resources are implemented.

ICT in education.

ICT has become a central part of our daily lives, especially in the field of education, where new advances, new policies and educational reforms take center stage (Cabero, 2010). Likewise, UNESCO (2016) considers ICT as an array of services, networks, software and devices which are integrated into an interconnected and complementary information system. ICT aims at improving the quality of life of people .Bunge (1995) defines technology as "the field of knowledge related to the design of devices and its development, operation, setting, maintenance and follow-up in the light of scientific knowledge" (p. 55).

Navarrete and Mendieta (2015) argue that the incursion of Technology in Education is a fact, currently the use of technological resources within educational training is increasing, but its implementation does not provide positive results related to the acquisition of new knowledge (p. 123-136).

Using ICT in the classroom.

The number of teachers using ICT in their classroom is increasing because it helps them in their daily work, and their students respond to it with a greater motivation and attention in class. Therefore, some teachers have made some efforts to get the required devices to incorporate ICT into their daily activities. In this sense, "technological resources and infrastructure are effective and efficient in the work of the teacher. An effective use of ICT in the teaching-learning process requires that both teachers and students integrate it naturally in their academic practices within the classroom" (Acevedo et al. 2014, p. 19).

On the other hand, computer resources available in some educational institutions are very scarce and that situation makes it difficult to incorporate new technologies in the classroom. Teachers may count on multimedia didactic material, but because of the lack of technological infrastructure they may not use them, and often end up working in the traditional way using books and a regular blackboard. It is very important that deciders of the Ministry of Education and Culture take the necessary steps to provide educational institutions with the required equipment to teach. Without such resources, teachers sometimes lose motivation, time and effort to integrate them into their classes.

For Espejo and Trucco (2014), "the use of ICT depends largely on the capacity and skills of all the actors involved in the educational activity, primarily students and teachers, and their interactions with the electronic resources available in the classroom" (p.70). In other words, it is essential to understand that the use of ICT in the classroom implies systematic,

methodological and behavioral changes, whether in the design, planning or organization of the development of all educational activities. Incorporating and using IT in the school environment requires time to be well adopted.

Evolution of ICT in education.

The history of world education has been marked by several revolutions according to Suárez and Custodio (2014). They quote Rosario, who argues that the first revolution was the spreading of the writing through literacy. The second one was the emergence of schools, which brought the figure of the teacher. The third one resulted from the invention of the printing press turning paper into a massive support for information. Finally, the fourth revolution was the rise of the new technologies.

Nowadays, technologies have changed a lot; new magnetic and optical supports have appeared. Information is now digitized, going from pencil and paper to keyboard and screen. The computer is not just a sophisticated and calculating machine, it is also a device used to communicate and transmit information either face-to-face or virtually, synchronously or asynchronously. In other words, the combination of educational computer applications with electronic devices is giving rise to a new way of teaching and learning (Rodriguez, 2020).

2. Devices and applications.

2.1. Computer devices.

Teachers have been relying on technology in their daily work for several years now: calculators, printers, computers, projectors, tablets, cell phones and even more advanced technological elements have been integrated into the educational environment. Interactive whiteboards, virtual classrooms, and countless electronic resources for conducting research or doing school work are just some of the ways in which digital technology has been integrated with education (Boorman, 2017). The emergence of new technological devices and the development of uncountable new computer applications have made human daily activities easier, including, in this case, the educational process.

2.1.1. Use of Educational Devices and Software in the classroom.

In their classroom, students mostly use cell phones, tablets and laptops. They often use them to follow specific links or to access applications found in printed textbooks. However, some students also tend to use such devices and applications in ways that do not contribute to their education.

Since April 17, 2014, through Ministerial Agreement 70-14, the Ministry of Education issued regulations for the use of cell phones and other mobile devices in educational institutions of Ecuador in order to promote the use of new technologies. The document states that cell phones should not be considered as mandatory resources or as part of school supplies. It also states that using such device is under the responsibility of the teacher. In addition, according to the State program, only students in eighth, ninth and tenth grades of general basic education and high school may use them (Espinosa, 2014).

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2.2. Applications (Educational software).

Application is a generic word that refers to computer programs created with the specific purpose of being used as teaching aids. In the same sense, Caccuri (2015) refers to "educational programs or didactic programs, which have been developed to facilitate teaching and learning processes". It is called "educational software" because it is designed specifically for teaching and autonomous learning. Besides this, it also contributes to the development of certain cognitive skills.

3. ICT in the Ibarra Educational Unit.

In the magazine "Colegio Nacional Ibarra (CNI) 60 years", Méndez (2012) describes briefly how ICT has been incorporated in the Ibarra Educational Unit, which was pioneer in the use of computers in education. The Secretariat Department was the first to be equipped with a computer in 1986 for accounting and administrative tasks. Following Ecuadorian High School Reform, the first High School diploma in Sciences, with specialization in Computer Science opened for the school year 1993-1994. The same year the first computer lab equipped with 10 personal computers was inaugurated. Afterwards, computing was introduced as a subject in the curriculum. In 1996, the Computer Center was created. Staff was in charge of maintaining computers, as well as checking and developing programs required by the institution. Since the 1997-1998 school year, grades have been filed thanks to an automated system for grades and enrollment (Escosoft). Currently, the institution has eight laboratories, fourteen projectors, two digital boards. In addition, all departments can count on computers to provide better service to the community. In 2015, the Ministry of Education provided most teachers with a laptop computer.

This time, facing the XXI century, the Ibarra Educational Unit takes up the challenge of incorporating new information technology in the teaching and learning process. Everyone, without exception, is exposed to profound changes as we adjust to technology that helps us to keep in touch with the world. The task is not an easy one but neither teachers nor students can be ruled out from the educational process. For UEIbarra it is very important to progress along with technological advances, creating communication channels and innovative interactive learning scenarios for the educational trilogy in the north of Ecuador.

4. Methodology.

This quantitative research was conducted according to the descriptive method. It focuses on determining teachers' technology skills. To do so, an online survey was submitted after being previously validated by experts. Thus, very important information was collected about teachers' background, class planning and about the teaching-learning process in general. The objective was to analyze the most commonly ICT tools used by the teachers of the Ibarra Educational Unit in their teaching-learning process.

The survey was applied to a randomly selected sample of 112 teachers of the Unidad Educativa "Ibarra". The sample was made of 71 women (63.4%) and 41 men (36.6%). Age ranged from 25 to 60 years old with an average of 47 years. Respondents were distributed among all levels of education (initial, elementary, middle school and high school).

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The questionnaire was developed and submitted in Google Drive forms. It was made of 45 questions about ICT knowledge and skills. It was structured by items and five possible answers were proposed as follow: none, little, regular, sufficient and a lot. The results were compiled on a Microsoft Excel spreadsheet, which facilitated the interpretation and analysis of the data.

5. Results.

The results of the analysis of the data collected through the questionnaire filled out in Google Drive by the teachers of Ibarra Educational Unit are now presented. Once the data was collected and processed, the respective analysis and interpretation of these data was carried out using a Microsoft Excel spreadsheet.

From the analysis it was determined that all the teachers surveyed have incorporated the use of technological tools in their curricular activities in different ways. They did so in response to Ecuador's educational policies, but also to remain at the forefront of the digital and information era. However, since the access to in-house training programs for the development of technology skills is limited, most teachers are self-taught. Hence, only 20.54% of teachers qualify their use of ICT tools (advanced Internet, collaborative tools, specific software, search, processing and storage of information mechanisms) as sufficient while only 5.36% qualify it as advanced.

Age and gender of teachers

*Age of teachers*   *% men   % women*
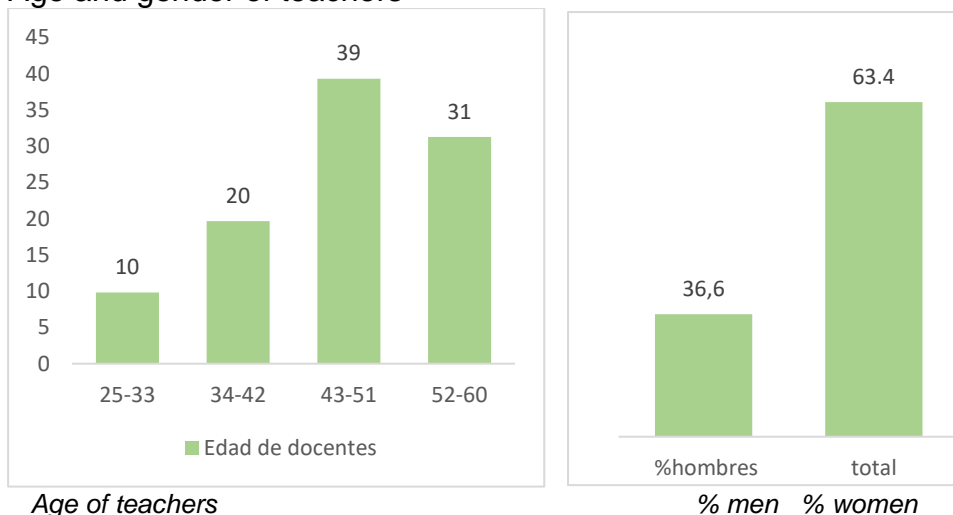
Graph 1. Age and gender of teachers.

One can see that 30% of the surveyed teachers are between 25 and 42 years old. They are considered as digital natives, i.e. people who use information quickly. 70% are between 43 and 60 years of age. This group benefits from a great teaching experience, but they are not always skilled in the use of ICT tools in the educational field. They may experience some difficulties in adapting to technology advances. 63.4% of teachers surveyed are women and 36.6% are men.

Advanced skills in the use of technology tools.

Percentage IT Advanced skills
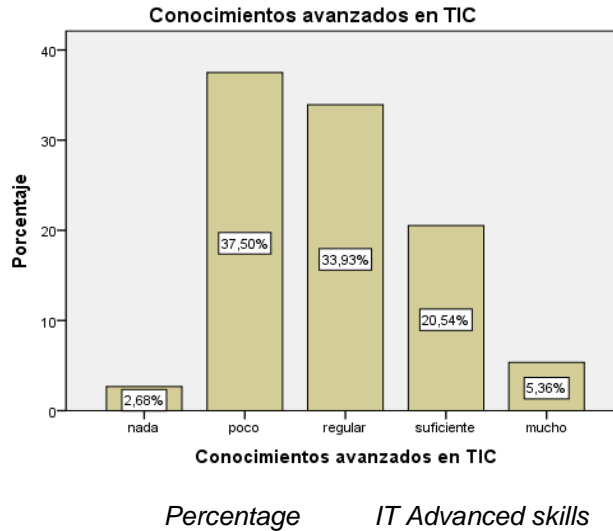
Graph 2. Advanced skills in the use of technology tools.

Analysis of the data in graph 2 shows that only 5.36% of the teachers have an advanced level while 20.54% of them claim to have sufficient knowledge in the use of ICT tools. Consequently, they can analyze, share, search, select, store and manage programs related to their specialty within their teaching practice. 37.50% of teachers consider that they do not have sufficient ICT skills while 33.93% assess their knowledge as regular. Adding up both groups shows that 71.43% of teachers have not integrated ICT enough to their daily activities. This figure is quite worrying.

Office software skills
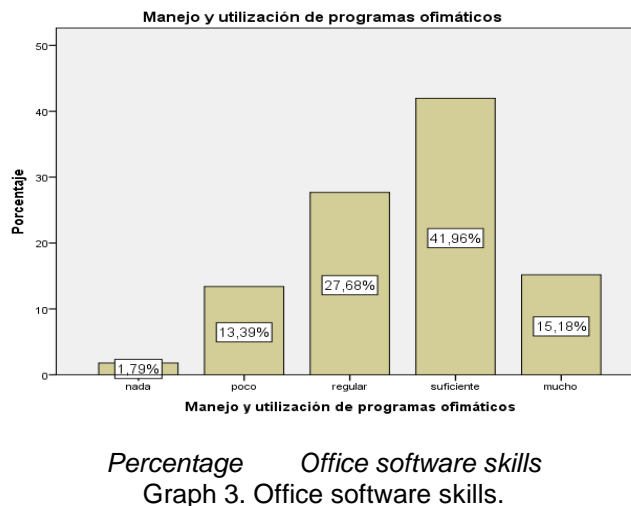

Percentage Office software skills
Graph 3. Office software skills.

Over 56% of teachers consider that they have sufficient proficiency to use office programs, i.e., they consider these resources as a work tool in their daily activities. It can also be seen that 27.68% of them perceive their skills as intermediate in the handling of such software, while 16.96% think they have a low level of skills. Finally, 1.79% of them do not use these applications.
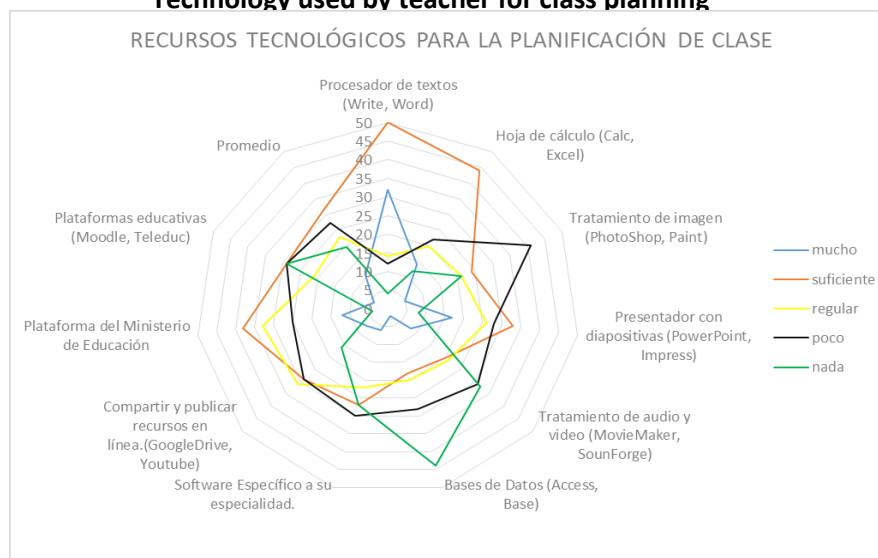
Use of Internet.
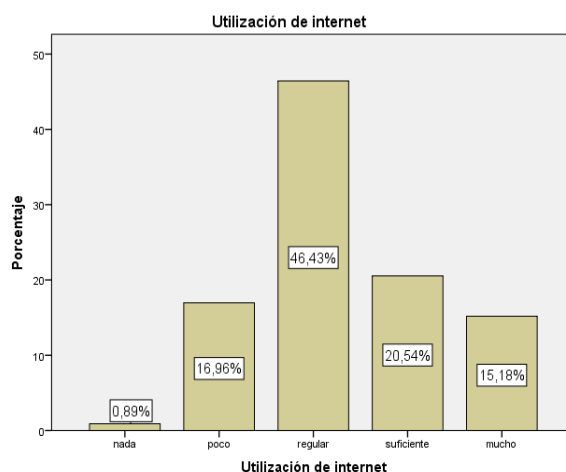
Percentage / none, little, regular, sufficient and a lot.
Graph 4. Use of Internet.

Using Internet allows teachers to strengthen digital interaction with their students. More than 90% of teachers at different levels have some knowledge of the Internet. In this sense, the graph shows that teachers have an intermediate level of Internet usage.

Technology used by teacher for class planning

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Word processors (Write, Word), Calculation spreadsheet (Calc, Excel), Graphic editors (Photoshop, Paint), Presentation programs (Powerpoint, Impress), Video Editing software (MovieMaker, SunForge), Database 5access, Base), Specialized software, Sharing and publishing data online (Google Drive, Youtube), Ministry of Education platform, Learning management systems (Moodle, Teleduc), Average
Graph 5. Technology used by teacher for class planning.

Word processors, the ministry platform and presentation programs are the favored software used by teachers for class planning. Spreadsheets, Google Drive and graphic editors are only used by the teachers with sufficient knowledge.

Improving the use of IT
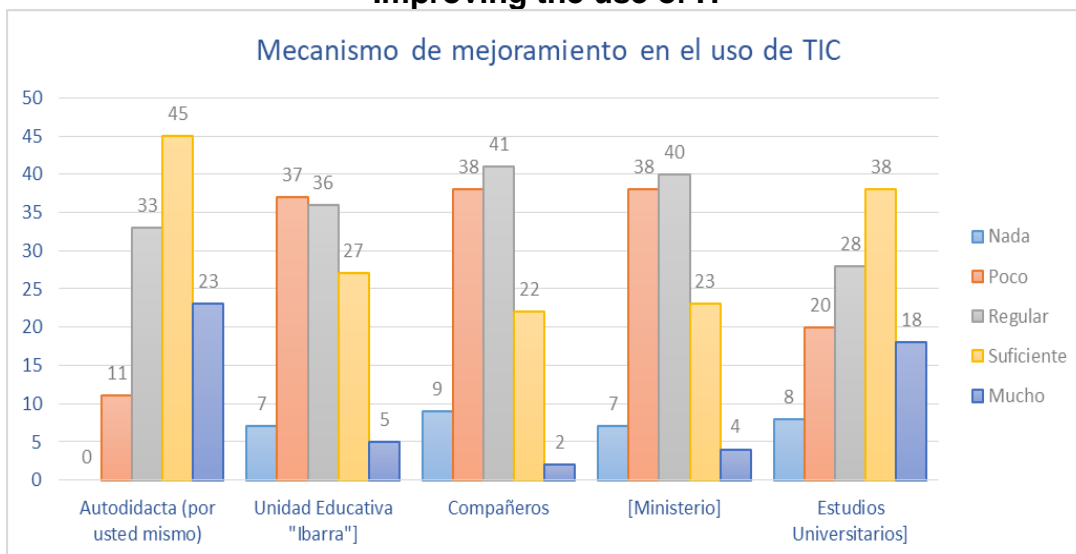
Graph 5. Improving the use of IT.

Teachers at Ibarra Educational Unit have set up a few strategies to increase the use of IT. They mostly rely on self-training but, to a lesser extent, they can also count on the ministry of education and the help from colleagues to update their knowledge in the use of technology.

6. Conclusions.

In the last decade, the trend has been to incorporate ICT in the teaching practice. As a result, teachers use them to different extents and according to the generation they belong to.

That is to say, "today, teachers work in a technological environment, it is not enough to manage technology, but they must be digitally competent and expert (Caccuri, 2015).

This research highlights that some gaps remain which prevent teachers to fully incorporate ICT in their daily activities. Also, this research work allows us to have a clear idea of the type of ICT tools which play a significant role in Ecuadorian education and in any educational system worldwide. That is why this work reflects this great opportunity to teach using technologies.

Technological devices and resources have now fully entered the educational system in terms of pedagogical use as well as management and administration. In this regard, it is possible to argue that there is currently a need to universalize access to these technologies, but also to promote inclusion to the digital culture, and to modify the traditional patterns that still rule the educational system.

Making ICT part of the teaching-learning process requires a set of skills that teachers must develop. Taking advantage of ICT tools allows them to count on a new methodology. To do so, teacher training should be considered one of the primary options before taking on new educational challenges (Hernandez, 2017).

Córdoba and Polo (2016) state that students mostly use technology devices for their personal use, and they would like all teachers to shift their didactic strategies towards the use of technologies in the classroom. They suggest teachers to use multiple devices and applications to make their classes more dynamic and fun (pp. 113-125). In this sense, UEIbarra teachers mostly rely on office automation programs such as word processor (e.g. Microsoft Word) and presentation software (e.g. PowerPoint) in their teaching-learning strategy. For administrative purposes, they keep using the Ministry's platform and the institution's grading system, where they log the students' grades and attendance. Meanwhile, Internet and e-mailing serve as communication channels. Teachers should deepen their knowledge of certain technology tools in order to make searches in specialized databases. They should also bring into their classes specialized software related to their subject. It would be beneficial as well to share and create work groups with other professionals of their area, in order to keep up with technological advances and with the knowledge of their students.

To conclude, the incorporation of ICT in the teaching practice of the Ibarra Educational Unit during the last decade has improved, but it still requires decisions and actions to ensure its sustainability, and to guarantee educational quality.

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