ICTS AND NEW SCENARIOS FOR DIVERSITY

AS TICs E NOVOS CENÁRIOS PARA A DIVERSIDADE

LAS TIC Y LOS NUEVOS ESCENARIOS PARA LA DIVERSIDAD

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ABSTRACT

Research is a process aimed at seeking new knowledge, in this case, it will try to find alternative ways in the field of new technologies that support special educational needs. Society demands these technological contributions to solve problems and allow man to work with greater ergonomics; The school, a social institution, also requires these resources so that all students can build a functional and meaningful teaching-learning process. The Educational System proposes an education that meets the educational needs of all students; and from these pages it is intended that new technologies be a means of support that addresses diversity.

Keywords: ICTs. Diversity. Inclusion.

RESUMO

A pesquisa é um processo que visa buscar novos conhecimentos; neste caso, buscará caminhos alternativos no campo das novas tecnologias que apoiem as necessidades educacionais especiais. A sociedade demanda esses aportes tecnológicos para solucionar problemas e permitir que o homem trabalhe com maior ergonomia; a escola, instituição social, também necessita desses recursos para que todos os alunos possam construir um processo de ensino-aprendizagem funcional e significativo. O Sistema Educacional propõe uma educação que atenda às necessidades educacionais de todos os alunos; e, a partir destas páginas, pretende-se que as novas tecnologias sejam um meio de apoio que contemple a diversidade.

Keywords: TICs. Diversidade. Inclusão.

RESUMEN

La investigación es un proceso orientado a la búsqueda de nuevos conocimientos; en este caso, se buscarán alternativas en el ámbito de las nuevas tecnologías que apoyen las necesidades educativas especiales. La sociedad demanda estas contribuciones tecnológicas para resolver problemas y permitir que las personas trabajen con mayor

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ergonomía. La escuela, como institución social, también requiere estos recursos para que todo el alumnado pueda construir un proceso de enseñanza-aprendizaje funcional y significativo. El sistema educativo propone una educación que satisfaga las necesidades educativas de todo el alumnado; y desde estas páginas se pretende que las nuevas tecnologías sean un medio de apoyo que atienda la diversidad.

Keywords: TIC. Diversidad. Inclusión.

INTRODUCTION

Society advances at a dizzying pace, the future becomes immediately present, the institutions that make up the different spheres provide efficiency, quality, drive and validity in a minimum of time; and education cannot remain withdrawn, it must be in accordance with the world in which we live. And a key piece of most social systems are new technologies, they support current and future projects in all areas, and here we stop, since it is also the case in education.

ICTs as an educational instrument will have to create immediate responses to be able to address diversity; It will have to solve pending issues in teaching regarding subjects with disabilities, handicaps and/or disabilities; New challenges will have to be raised in the face of equal opportunities for all subjects with the right to a decent education; material resources will be created so that students, whether or not they have special educational needs, can learn without distinctions; In short, research must be at the service of the educational process, in this case, innovating and creating technological resources that can be incorporated into the inclusive classroom.

We can observe that when talking about media and new technologies applied to attention to diversity it is necessary to focus on two important points:

to. Keep in mind that these materials have the purpose of integrating the students; Teachers must include these media as a resource capable of adapting to a wide range of students' educational needs; Otherwise, we would be segregating the subjects for having some learning difficulty.

b. Research must be at the service of education to design and produce specific media that can be of help and benefit to people with special educational needs.

Educational institutions, throughout their history, have used different technological resources to support their activities. Traditionally, the educational resources used only allowed information transmission processes to be carried out in a unidirectional and passive manner for students through standard formats, while, on the contrary, the new ICT incorporated in recent decades have made it possible to guarantee bidirectional, higher levels of interaction between teachers and students, and the use of new multimedia formats. In the case of Chile, in recent years the use of ICT in education has increased considerably, in response to the changes brought about by the introduction of new technologies to the teaching and learning processes, which has opened the possibility that education reach a greater number of students, also allowing for greater personalization of the teaching and

learning processes, a necessary condition to achieve significant learning and finally, it has offered the possibility of providing students with the technological and pedagogical resources that eventually allow them be agents in the production and distribution of knowledge. This introduction of ICT to education has been the result of a process fundamentally planned, implemented and promoted by the Enlaces Program, an initiative that dates back to the early 90's.

This program began in 1992 as a pilot initiative and aimed to introduce infrastructure and connectivity in schools, implement digital resources, develop teacher training and carry out methodological support, promoting educational equity and quality. In 1998, this program became a national-level initiative, dependent on the Ministry of Education, and in 2006, 92% of public schools had appropriate infrastructure. According to Sánchez and Salinas, the implementation of Enlaces considerably improved access and use of ICT. Even the World Economic Forum report, which aims to compare the use of technology between 143 countries in different social areas such as work, daily life and education, places Chile as the best positioned Latin American country in the region. However, the measurements carried out in 2011 by the Ministry of Education of Chile, through the SIMCE TIC to New Ideas in Educational Informatics TISE 2015 , 222 school students, make some limitations evident. The skills evaluated, which go beyond a purely technical domain, involve the ability to solve real-life problems in digital environments.

The results obtained reveal that three quarters of the students can be considered functional manipulators of technologies, that is, they have the ability to search for information, organize and manage digital information. Notwithstanding the above, only a third of students are capable of developing higher-order cognitive processes, which involve the development of their own ideas in digital environments. In summary, although there has been an intention to promote the use of ICT particularly in education, a large part of users are still not capable of constructing and/or distributing knowledge and information in an agentive manner. Considering the above, it is necessary to know what is actually investigated when the relationship between ICT and education is empirically studied.

With this objective, this review seeks to account for the current state of research on the subject, through an updated and systematic review of the literature that allows us to assess the state ê of research regarding the use of technology and its relationship with processes. of learning in which it is involved, seeking to answer the following questions: What

are the real uses of technology for educational purposes? What is the effect of its uses on the teaching and learning processes?

I.- The concept of ICTs and education

As a prior step to describing the findings of this review, it is necessary to clarify the terminology related to the topic that gives rise to this work. In more concrete terms, address concepts and definitions related to ICT and education in Chile. The concepts that arise from this thematic area are related, for the most part, to the use or employment of technology in the teaching and learning process. When talking about the use or application of technology in educational contexts, reference is commonly made to digital technologies in general, which can include software, television, smartphones and the Internet. More specifically and for the purposes of this review, the concept of ICT will include all those technologies or digital resources, mentioned above, used for the purpose of communicating, creating, disseminating, saving and managing information in teaching and learning situations.

One of the main and most recurrent concepts in the reviewed literature is that of information and communication technologies or ICT. For this same reason, this concept also has multiple meanings, something similar occurs with the term e-learning or online learning/education, Distance Learning and Computer Supported Collaborative Learning (CSCL). Similarly, the term e-learning or online learning/education refers to the teaching and learning processes facilitated through ICT, specifically the Internet.

Distance learning/education, meanwhile, is defined as all those teaching and learning situations where teachers and students do not share the same space and time. The above is also related to the concept of blended learning or b-learning, which refers to those instances that combine teaching and learning processes in face-to-face and non-face-to-face contexts. For Allen & Seaman, blearning (also called hybrid learning) consists of instructional processes where much of the content (30% to 80%) is provided online.

A line of research that manages to group these generic concepts commonly used when we refer to technology and learning is Computer Mediated Collaborative Learning or CSCL (Computer Supported Collaborative Learning). The CSCL is a multidisciplinary line of research that is based on collaborative learning and information and communication technologies. In simple terms, this area of research studies how people learn together with the support of computers, placing emphasis on the construction of knowledge that occurs in teaching and learning situations.

This area of research has different focuses, but fundamentally it focuses on the idea that the construction of knowledge and subsequently, learning are processes that occur through the mediation of technology. This concept of mediation has its origin in the sociocultural perspective of teaching and learning that arises in accordance with the ideas of Vygotsky and his followers. As Coll, Mauri and Onrubia maintain, the development of higher psychological processes that operate in learning are characterized by the use of socially acquired instruments of symbolic origin such as language and other representation systems that mediate between the subject and that which is the subject. object of their learning (content).

Similarly, ICT constitutes a means of representation that can introduce favorable changes in learning since it implies that students develop new skills through these new forms of transmission, processing and use of information. According to what Rassmussen & Ludvigsen stated, this mediation process is based on the hypothesis that individual agency and, therefore, the construction of knowledge, occurs through the relationship and interaction with other individuals in diverse social contexts. Similarly, the relationship between the learning process and technology is located at the intersection between the individual and what surrounds him, that is, this relationship occurs through the mediation of cultural tools, which can be mental and/or materials. Another dimension of the relationship between ICT and education is related to the abilities or skills that students have to use these tools, called computer literacy, media literacy or ICT skills in English. This area is related to the development, measurement and comparison of skills and/or abilities in the use of ICT in teachers and students.

In the field of teaching, much of the research carried out corresponds to teacher training, which in turn is divided into initial teacher training and university teaching training. In this area, a previous review carried out by Claro (2015), which summarizes research related to the impact of ICT on the learning of Chilean students, indicates that the improvements reported in learning are fundamentally related to the development of specific skills in the use of ICT in also specific areas of knowledge, with greater impacts reported in the uses and skills of ICT in the areas of language, mathematics and science.

Minor impacts are also evident in 'other' learning such as motivation, digital literacy and the development of transversal skills and abilities. In short, considering the background presented above, it is widely known that ICT can contribute to considerably improve the processes of New Ideas in Educational Computing (TISE 2015), teaching and learning, in

some cases, an appropriate use of these Technologies can generate a significant impact within the classroom, specifically when they mediate the relationship of the users of these technologies with the information and with other users.

In this same sense, there is also agreement that the use of ICT contributes considerably to facilitating processes related to learning, such as the transfer of information, the exchange and development of ideas, the exploration of shared resources and collaboration in the construction of knowledge. . However , this relationship is somewhat more complex, considering that the introduction of technology to teaching processes does not modify or improve learning processes by itself.

Returning to the approaches supported by the sociocultural perspective mentioned above, the acquisition or development of skills in the use of ICT refers to the meaning given to information through the use of socially and culturally available resources and the way in which they are used. these resources in communication through different formats and media. Thus, technology is conceived as an available cultural tool that also changes over time. In this same sense, the acquisition of competencies and/or skills in the use of technology for educational purposes exceeds simple "literacy" that is related to basic communication skills with the support of technology and is closer to higher-order cognitive skills that They are linked to the creation of content and construction of knowledge through or with the mediation of technological tools or supports.

Sefton-Green, Nixon & Erstad, point out that these ICT skills and competencies can be summarized in: basic skills (general use of a computer that includes aspects such as the use of text editing software and other basic programs), skills related to access and management of information (perform Internet searches, download information, classify and critically reorganize it) and skills related to content creation (communicate information through different media and formats and interact or collaborate with others to create new content) .

WHAT DO WE UNDERSTAND BY NEW EDUCATIONAL TECHNOLOGIES?

We can say that technological development defines social change, and that consequently technology has a direct and significant influence on society, which means that it also has an impact on the educational field. But what is meant by "New Technologies", according to Martínez (1999) explains that in recent years this term has been coined to refer to a series of machines whose common denominator is having been created from the

material development of microelectronics and which They are being applied in various communication systems; and the idea of "progress" has been associated with new technologies; In short, they are electronic tools in continuous development.

These new technologies have a formal aspect, since they are "media" that consume, store, use and provide data; and a material aspect, they have storage and complementation capacity, and speed.

The new educational technologies that are being progressively incorporated in Educational Centers are innovative means that will allow members of the educational community to develop more complete and effective training due to the characteristics offered by these resources, among which we can highlight: great ability to adjust and adapt to the different characteristics of individuals, group work, the sender and the receiver can be in different places and times, training in technological content, among others.

In the educational process, technological resources must be incorporated that are truly useful for all students because, faced with a diversity of individual characteristics, the teacher must resort to mechanisms that offer adequate performance. There are many social institutions, worldwide, that obtain a beneficial result from these technologies, and at the educational level, the compensation that comes with working with them should also be taken advantage of.

HOW TO ADDRESS DIVERSITY WITH TECHNOLOGICAL TOOLS

Educational development is based on an understanding between the teacher and the students; for this, good communication is necessary; This does not occur in a vacuum, in this case, its context is the classroom, and according to Schramm (1973; cited in Cabero, 1999:39) "to communicate you have to want to do it." Communication is a process of data transmission and acquisition; it is an explicit and implicit statement of information that the sender intends to express to the receiver; In an inclusive classroom, individual differences are quite a few, so attention must be paid to ensuring that there is fluid communication between members.

We must say that new technologies as an educational resource will help us so that the teaching-learning process enjoys good communication since there are hardware and software adapted to the educational needs of the students and thus, the teacher can teach his work without difficulty of understanding.

Educational technological resources have a high capacity to adapt to handicaps, deficiencies and/or disabilities that may occur in the classroom; An example of this could be the different hardware and software that we can use so that students work with multimedia equipment and can access them without causing segregation between subjects with special educational needs and the rest of the individuals. Regarding these hardware and software mentioned, we can present a series of examples depending on the type of disability (Toledo, 2001):

1. Motor disabled: keyboards adapted to subjects with psychomotor problems where the speed of key repetition and the sequence of keystrokes on the keyboard, switches or pointers are modified to access computers, telephones, etc. for students who cannot move their fingers and type (hardware); Voice recognition programs for subjects who cannot use the keyboard due to their limitation (software).

2. Visually impaired: screen amplifiers for people with low vision, and they would be like a kind of magnifying glasses (hardware); The "DILE" program is an encyclopedic dictionary in Spanish designed to be used by people who are blind or have severe visual problems (software).

3. Brain injuries and cognitive delay: the "Millie's Math House" program, which consists of six activities where students can explore mathematical knowledge (software); "Trudy's House of Time and Space" also includes five activities, but referring to geography and time (software).

Equal opportunities can be a reality today with the help of these technological advances. All subjects enrolled in Educational Centers that receive formal education must receive adequate support according to their specific characteristics (Arnáiz, 1996); Education must be tailored to everyone, otherwise we would be segregating and discriminating against students (García Pastor, 2000); From these pages we propose the need for a legal framework that responds to diversity, as well as functional, human and material resources to bring theory to an educational practice accessible to all. We previously said Fuentes Magazine 4, Pere Marquès Pilar Casals (2003), that educational research is an essential tool so that teaching can develop and adjust to all learners; New technologies can provide this service as material capable of adapting to special educational needs and teachers trained in these resources will be the appropriate personnel to instruct.

The use of new technologies for educational purposes must open new doors in the teaching-learning processes for those who use them and important benefits can be obtained

in education. Although we do not intend to cut back on traditional material such as textbooks, blackboards, worksheets, we must say that these are characterized by the unidirectional relationship between them and the recipient; and in favor of new technologies we must say that good use and knowledge of them promote bidirectional communication processes, which is why we say that for this both students and teachers must be trained in the use, language and ideological criticism.

In this educational context, and Fuentes Magazine 4, Pere Marquès Pilar Casals (2003), Muntaner (2000:775) states: "...interactivity with computer and audiovisual technologies should mean the construction of new knowledge that can be represented in a different way than what we are used to."

Now, since the presence of personal computers in homes began to expand in the 80s, a race of advances began that had a boost in 1990 with the penetration of the Internet and that in recent years with the possibilities that cell phones have our Society has changed. A change that should be reflected in education. There are many views to be taken in which, perhaps, the educational use of these tools is a very important topic but it is not the only one.

Let's start with initial education , where everything begins. The digital world is approaching these levels. Is it appropriate? Should the construction of all competencies be different? Families have an important role at these ages. Are they aware of the harms/benefits of parking their child with technological devices?

Something similar happens in primary education . The media is full of news, some not so true, such as that in a leading country handwriting is eliminated, the fact that a public school in Madrid forces 6-year-old children to be equipped with a 650-euro iPad. , and many similar ones. Faced with these situations, what attitude should education take? At this level, the relationship with two aspects of life such as nature and art. Are they used? Are they taught? What role should we give to technologies in the education of a 10-year-old boy or girl?

When we face secondary education and high school we must begin to keep in mind the end of that stage. Is it the same knowledge that we should give to students in the digital society as in the industrial one? An issue that may require major reforms so that when our students arrive at university they have the knowledge, attitudes, skills and content that are required. An example, the ability to work as a team. Another example is digital citizenship. Our students pass high school and spend a large part of their social life in the digital environment. Do we educate them for this? Do they know how to protect their privacy? Do

you know how to react to digital harassment? At these levels, technologies take on a more present role in education. Education cannot be neutral in the face of commercial interests and must defend technological independence so as not to create tied consumers for tomorrow.

An important point for the new economy is the capacity of education to train professionals suitable for the new labor markets and at this point professional technical education plays an important role . It must stop being the second option, it must offer attractive studies due to its connection to the new society and its employability.

Our public inclusion policies have several constant mottos. One of them, perhaps the main one, is to promote inclusive education , in which everyone feels welcomed, in which young people have the opportunity to be in the classrooms and in which their right to be educated is not expropriated. Can the digital environment help us in this sense? Could it be a means that helps us drastically reduce school failure? How?

Two instruments are mainly affected by the digital tone. On the one hand, reading and writing and on the other hand, mathematics. They are two curricular spaces that have been present since childhood education. Their good learning is transferred to other subjects and therefore has great relevance. How do we approach literacy in the digital society? Mathematics has found a great resource in GeoGebra and other free tools that can be used from primary school to university and behind which there are a huge number of developers who improve and expand them.

Regarding these reflections we have two pending issues. The first is teacher training, both initial and continuous. It is necessary to give a relevant role to the digital environment. Teachers must know the tools they will have at their disposal and be able to keep up to date, and for this collaborative work is essential.

The other pending issue, and perhaps always pending, is that of evaluation . We must move from words to actions. 50 years ago we talked about grades, about numbers, and with increasing force now we talk about evaluations, that is, about assessments that are not always transferable to numbers. Many teachers find themselves with elaborate evaluation work that they cannot then transfer to data collection tools that do not allow them to incorporate anything other than a number. We must break numerical inertia and go qualitative. Are new possibilities opening up thanks to the digital environment?

THE CHILEAN EXPERIENCE

In recent years, Chile has considerably increased the use of ICT in educational contexts. Despite this progress, there is little information that reports on the research that has been developed in this matter. With the purpose of knowing the state of the arts in education that uses information technologies, a systematic search of the literature was carried out that resulted in 90 works, of which 45 were selected that correspond to studies published since 2005 in forward and obey previously defined criteria to ensure the rigor and quality of the review. The findings refer to three large areas: research related to the development of skills and use of ICT, development of ICT competencies in teacher training and use of technological supports in educational contexts. The findings of this review allow us to have a clearer picture regarding the work of education and ICT in Chile, showing that the majority of the research developed in the area refers to the measurement of the use or skills in ICT in teachers and students. or technological devices and very little to the impact that technology has on learning. Categories and Subject Descriptors [Computers and Education]: Computer Uses in Education. General Terms Documentation, Human Factors. Keywords Systematic literature review, ICT in Chile, Empirical studies.

Virtual education with e-learning and b-learning modality for teacher updating is an initiative with coverage throughout the Chilean territory and is financed by the Ministry of Education of Chile through the Center for Improvement, Experimentation and Pedagogical Research (CPEIP).). It has been developed by the Center for the Development of Innovations in Education. The training is inserted within the framework of the curricular reform, and incorporates ICT resources in learning and training activities. teacher.

This modality was born in the context of a line of teacher training with the support of a virtual component implemented by the CPEIP. On the other hand, a recent study carried out within the framework of the Enlaces project shows that 92% of establishments have technological infrastructure and 76% of teachers have been trained in the use of ICT, the above as a result of the implementation of the project. Links. On the other hand, the penetration of the use of ICT among teachers is increasing, with 80% of teachers having computers in their homes, 51% of them with Internet, and 58% of them with broadband (Collect and Enlaces 2004).

The development and implementation of the experience includes: a) the selection and training of tutors, b) the pedagogical design of the course, c) the design and implementation of the course on the Moodle platform; d) development of various resources to support

content, e) application of Pre and Post Tests and summative and formative evaluations. The course trained 786 teachers nationwide, divided into 29 courses, with an average of 27 students per course. For tutorial support during the implementation of the course, a community of tutors was created to support them in their course tutoring tasks in the areas: administrative, technical, social and pedagogical. The work methodology placed the teacher at the center of learning, as an apprentice who autonomously defines her learning path. In this context, the participant builds knowledge through interaction with: the materials, the tutor and classmates in a diverse educational environment.

The development and implementation of the experience included: the selection and training of tutors, for which Salmon's e-modetaring model was used, creating activities as learning objects. A profile was designed to select the tutors and they were trained through a course in the e-learning modality that concluded with a meeting in person. Regarding the pedagogical design of the course, which has been conceived under an interactive model for teaching mathematics whose conception is very close to the expression of the Madison Project, which is summarized in: "guess – try, put the idea on trial – watch what happens and… learn how continue.

ON THE OTHER HAND The design and implementation of the course on the Moodle platform ; gazed out the organization of the contents in units, which have three areas: Activities and Evaluation : it is the set of activities organized weekly, within the week by day and within the day, the specific activities with a brief description and estimated time development, considers a weekly formative assessment and grading per unit; Interactions: includes a discussion forum, a space for consultations and a wall diary; Library: groups different resources such as readings, guides, Applets, educational material reference.

For the development of the various content support resources, guides, reference material, applets (component of an application that runs in the context of another program, for example, in a web browser), readings, references to sites WERE IMPLEMENTED. , among others resources. Likewise, a Pre and Post Test was applied at the beginning of the course, a pre-test and at the end a post-test. IN THE Obtaining and analyzing the information, statistical data were taken on participation in face-to-face sessions, evaluations with ratings on the platform and registration of participation in interactive spaces in the platform.

RESULTS AND DISCUSSION

This section presents the main results of the course, they have been obtained through the different information registration systems such as: the application of the Pre and Post Test, attendance at the face-to-face tests, the results of the summative evaluations on the platform. and the data obtained from the platform regarding participation in interactive spaces.

Participation in the course

During every week, the active students in the course were monitored, issuing a weekly report which accounts for the number of active and inactive students in the week, in addition to counting those without any connection in the course. course.

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Participation in Face-to-Face Sessions

The course includes three face-to-face sessions, at the beginning, end of the course and after the first unit of content. For the development of these face-to-face sessions, the tutor was given a plan to follow with the activities to be developed and digital resources as a presentation for his support.

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Participation in exchange spaces

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Participation in permanent spaces

Permanent spaces are a set of tools, mainly forums, that are available for use by participants throughout the course.

technical doubts are presented, an average of 5.5 per course. These doubts are related to the use of the platform and the configuration of the computers to run certain applications such as Applets. In the social forum there are 765 topics opened by the participants, within them there are various levels of interaction that are difficult to quantify, the average is 26.3 topics opened per course, remember that these topics are initiated and encouraged by the participants themselves, with none or little participation by the tutor, except in the welcome forum that the tutor starts in this space. The social forum becomes a kind of "teachers room" virtual".

In news, space restricted to publications only from the tutor that cannot be debated by the participants, 624 interventions are recorded with an average of 21.5 interventions. These correspond to information and guidance that tutors send to their students regarding the

development of activities, submission of evaluations and evaluation criteria, among others. others.

Participation in interactive spaces

Participation in the interactive spaces, although variable in each unit, follows similar trends that are subsequently reflected in the three units as a whole. In this sense, the discussion forum concentrates most of the interventions, followed by the daily mural forum and queries.

As can be seen, the course presented an effort to provide teachers in the second cycle of primary education with a quality improvement process, which allows them to build the knowledge, both disciplinary and didactic, necessary for the participant to improve their practices. pedagogical. The above in a distance modality that favors interaction with classmates and the tutor within a learning community. The main conclusions are:

High interest in participating in the course: The interest shown by teachers to improve themselves in Geometry has been reflected in the high numbers of enrolled and registered students, which confirms the perceived need to train in this area. A total of 1,004 registered participants are registered.

Active students : The number of students who have remained active in the course is highly positive, of the 1,004 original enrollees, 786 gave the summative evaluation 1, a 78% effective participation, and between these and those who take the final evaluation there is a retention level of 83% of participants. Additionally, an average of 670 participants connect to the course weekly, 85% of active participants.

Assessment of contents and resources : The contents of the course and the various resources it provides have been valued by the participants, due to their quality, contextualization and the feasibility that they can use them and transfer them to work in the classroom. The Applet applications have been the most innovative within this set , since they simulate geometric constructions.

The face-to-face meetings The positive aspects of the face-to-face meetings focused mainly on the possibility of carrying out collaborative work, sharing experiences, increasing the feeling of belonging and resolving doubts associated with the methodology and the use of technology. The first face-to-face session presented problems in its development due to the call and problems with the platform, the second one developed normally. Participants have suggested for future versions to incorporate work directly related to the contents and some, despite being a distance course, suggest more face-to-face courses.

The platform: The platform has shown great stability, it only had problems at certain specific moments in the development of the course, mainly related to the online questionnaires, in general terms it has been in a high percentage operational and accessible. The way in which the interactive spaces have been arranged are positively evaluated by the participants. They highlight its ease of use, they find it "friendly", they use the spaces frequently and find them useful. In this sense, providing differentiated spaces for discussion, sharing resources, clarifying doubts and interacting on free topics such as the "social forum" we believe is an element that contributes to increasing interaction and organize it. When participants are asked about the platform they usually end up talking about the course and that is a sign that it became "invisible" to them, it merged into a single great element: the course.

The Interactions: Interesting use was made by the participants of the interactive spaces. With 66% of the interventions concentrated in the discussion forums, the "Wall Diary" and "Consults" record 28% and 6% respectively of the interventions. There was also a permanent space in which the social forum attracted the greatest participation based on topics raised by the participants, transforming into a kind of "virtual teachers' room." In this sense, we believe that the key to participation was having established differentiated spaces for the types of interventions, which were able to channel the type of interventions that the participants normally carry out in these courses, in addition to the animation of the tutor, especially in the forum. discussion.

Community of tutors: The community of tutors has been a space that has allowed the coordination of the pedagogical and tutorial team that coordinates the project with the tutors, through it it has been possible to guide and support the tutors in the development of their work, The main spaces used have been: orientations, consultations, requests for information and reports, as can be seen, the first two dedicated to pedagogical matters and the remaining two to administrative matters. An active role of tutors is observed in this community, especially those who achieve better results in their courses.

The tutors: The tutors are relevant agents in the development of the course, they have developed various tasks in the areas: pedagogical, social, technical and administrative. The role played by them, especially at the beginning of the course to "enchant" those who did not attend the in-person session and during the times of assessments for students to take within the established deadlines has been vital to keeping students active. The work of these professionals has been highly valued by the participants, they perceive constant support in

the development of the course and its activities as well as the clarification of doubts of a pedagogical and administrative nature, they perceive them to be close and always attentive to resolve their doubts. A factor that has probably contributed is the weekly reports that were sent to them regarding the active and inactive participants of their course, this allows them to determine how their course is going in relation to their peers at the national level, several of them have received congratulations and recognition of the pedagogical team and their peers for achievements reached.

Formation of the groups: In large regions such as the Metropolitan Region where the capital of the country is located, we believe that forming the groups according to the teacher's address is not the most optimal, since it transfers the divisions that we make in the virtual environment to the virtual environment. labor sphere. Teachers from establishments in poor communities with their peers and those from more affluent establishments with their peers. This from the perspective of the social construction of knowledge and Vygotsky's concept of the Zone of Proximal Development is not very appropriate. In this sense, we believe that the participation of teachers from private establishments can become a contribution to the rest of the learning community, especially when they join groups from more popular sectors.

The Evaluations : At the general and unit level, important advances in learning are observed, reflected in the differences between pre- and post-test. Additionally, online summative evaluations also reflect these advances. A relevant element in our opinion is that the difference obtained in relation to the online summative tests and the pre- and post-test reflects that these are significantly closer to the post-test, which is why they account for the learning acquired, overcoming distrust. initial in terms that these do not reflect individual learning since the teacher is presumed guilty of carrying it out with additional support to his own knowledge.

The process followed by the participating teachers has been largely successful, without a doubt it can be perfected in various aspects. It has meant the development of a virtual teacher training experience that has given participants a new way of accessing content, quality materials and interaction with peers, tutors and specialists, on a topic that is a priority in the mathematical training of students. Chilean children such as geometry. The experience of this course shows a way forward in these new forms of teaching updating that integrate the use ôf ICT as a communication and training channel during professional life, giving access to a training experience that many of the participating teachers do not. would have had access to traditional face-to-face training formats.

CONCLUSION

Finally, I would like to point out a series of factors that can favor the incorporation of ICT in Inclusive Education, and among them we can indicate the following:

• Establish clear public policies for the use and incorporation of ICT in the classroom.

• Clear support from the management teams of educational institutions for their incorporation.

• The presence of ICT in the classrooms, in a way that favors the "invisibility" of ICT. And the existence of equipment that favors its adaptation to the characteristics of the students.

• Clear training and support policies for teachers for the incorporation of ICT for the school establishment.

• The organization of policies for the transfer of good practices, and collaborative work between teachers.

• The incorporation of subjects in teachers' initial training plans that favor the incorporation of ICT for Inclusive Education.

• And the strengthening of research to search for new media design proposals and the search for teaching strategies and methodologies for subjects with certain characteristics.

In any case, its incorporation involves teacher training (teachers have to be sensitive to the social reality and the historical moment that serves to encourage students' reflection and the taking of responsible and prosocial positions as future citizens), transforming the organizational structures of schools and adopting measures to enhance the visibility of ICT in educational centers. Along these lines, we must not forget that one of the great challenges of current education is to guarantee the quality of education for all students. To achieve this, it is necessary to establish didactic approaches that recognize the diversity of students and promote strategies in the teaching-learning process that make room for difference and encourage flexible responses in diverse educational contexts.

REFERENCES

1. Anderson, T., & Kanuka, H. (1997). On-line forums: New platforms for professional development and group collaboration. Journal of Computer-Mediated Communication, 3(3). https://doi.org/10.1111/j.1083-6101.1997.tb00078.x

2. Barberà, E., & Badia, A. (2004). Educating with virtual classrooms: Guidelines for innovation in the teaching and learning process. Madrid: A. Machado.

3. Bates, A. W. (1995). Technology, open learning and distance education. London: Routledge.

4. Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. Educational Technology, 35(1), 22–30.

5. Braslavsky, C. (1999). Bases, guidelines and criteria for the design of teacher training programs. Inter-American Journal of Education, (19), 13–50. Organization of Ibero-American States for Education, Science and Culture (OEI).

6. Bultron, C. (2000). New trends in education. In World report on communication and information 1999-2000 (pp. 51–67). UNESCO/CINDOC Editions.

7. Cabero, J. (2001). The application of ICT: Snobbery or educational necessity? Digital Network, 1. Retrieved December 22, 2002.

8. Collect & Links. (2004). Survey: Education in the information society. Links Statistics, 2005, 9–22.

9. Coll, C. (2001). Constructivism and education: The constructivist conception of teaching and learning. In C. Coll, J. Palacios, & A. Marchesi (Eds.), Psychological development and education II: Educational psychology (pp. 157–186). Madrid: Alliance.

10. Crook, C. (1998). Computers and collaborative learning. Madrid: Morata/MEC Ministry of Education and Culture. (Original work published 1994 as Computers and the collaborative experience of learning. London: Routledge)

11. Greening, T. (1998). Building the constructivist toolbox: An exploration of cognitive technologies. Educational Technology, 38(2), 23–35.

12. Gros, B. (2002). Constructivism and designs of virtual learning environments. Journal of Education, 328, 225–247.

13. Gros, B., & Silva, J. (2005). The training of teachers as teachers in virtual learning spaces. Ibero-American Journal of Education, 36(1).

14. Grünberg, J. (2002). REDOCENTE: An investigation into electronic collaboration between mathematics and science teachers. New Technologies in Education. Montevideo: University of the Republic.

15. Harasim, L., Hiltz, S., Turoff, M., & Teles, L. (2000). Learning networks: Guide to teaching and learning online. Barcelona: Gedisa/EDIUOC. (Original work published 1995 as Learning networks: A faithful guide to teaching and learning online. Cambridge, MA: Massachusetts Institute of Technology Press)

16. Hernández, P. (1997). Building constructivism: Criteria for its foundation and school application. In M. J. Rodrigo & J. Arnay (Eds.), The construction of school knowledge (pp. 285–312). Barcelona: Paidós.

17. Pérez, A. (2002). Elements for the analysis of educational interaction in new learning environments. Pixel-Bit: Media and Education Magazine, (19). Retrieved April 1, 2003.

18. Ryan, S., Scott, B., Freeman, H., & Patel, D. (2000). The virtual university: The Internet and resource-based learning. London: Kogan Page.

19. Salmon, G. (2000). E-moderating: The key to teaching and learning online. London: Kogan Page.

20. Swan, K., Shea, P., Fredericksen, E., Pickett, A., Pelz, W., & Maher, G. (2000). Building knowledge building communities: Consistency, contact and communication in virtual classroom. Journal of Educational Computing Research, 23(4), 359–381. https://doi.org/10.2190/W4G6-HY52-57P8-PPNE

21. Vygotsky, L. S. (1978). The development of higher psychological processes. Barcelona: Crítica.