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The Use of Digital Technologies in Teaching Mathematics: Resources, Perceptions and Challenges

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ABSTRACT

With the advancement of digital technology, some educational institutions such as schools and universities have rethought their values and teaching practices. A research study was carried out with students from the Federal University of Rio Grande - FURG, a degree in Mathematics, enrolled in the discipline of Applied Technologies to Mathematics Education I. During the course one of the activities the students talked with twelve teachers of public schools, on their pedagogical practice and the presence of digital technologies in the spaces of performance and produced reports, with the aim of understanding the pedagogical accomplishment of Basic Mathematics teachers linked to the use of digital technologies. From the records generated for analysis we used the Discursive Textual Analysis (ATD) in order to understand the phenomenon investigated through the discourses produced. In this study, three categories emerged from ATD: resources used by teachers, perceptions about the use of digital technologies (TD) and challenges in teaching mathematics. From these three categories, it was noticed that the main resources used by the teachers interviewed have been the didactic book and the internet for research of concepts. Among the main perceptions and challenges is the continuing education focused on the use of digital technologies. However, it is necessary to rethink the resources used in the classroom, as well as to create alternatives that meet the needs of the subjects involved and immersed in a technological culture and thus contribute to significant changes in teaching in the current scenario

KEYWORDS

Digital technologies. Teach mathematics. Perceptions. Challenges.

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O Uso das Tecnologias Digitais no Ensinar Matemática: Recursos, Percepções e Desafios

RESUMO

Com o avanço da tecnologia digital, algumas instituições de ensino como escolas e universidades tem repensado seus valores e práticas de ensino. Utilizou-se de um recorte de pesquisa realizado com estudantes da Universidade Federal do Rio Grande – FURG, curso de Licenciatura em Matemática, matriculados na disciplina de Tecnologias Aplicada à Educação Matemática I. Durante a disciplina uma das atividades os discentes conversaram com doze professores de escolas públicas, sobre o seu fazer pedagógico e a presença das tecnologias digitais nos espaços de atuação e produziram relatórios, com o objetivo de compreender o fazer pedagógico dos professores de Matemática da Educação Básica atrelado ao uso das tecnologias digitais. A partir dos registros gerados para análise utilizou-se a Análise Textual Discursiva (ATD) a fim de compreender o fenômeno investigado através dos discursos produzidos. Neste estudo, discutiu-se três categorias que emergiram da ATD: *recursos utilizados pelos docentes, percepções sobre o uso das tecnologias digitais(TD) e desafios no ensinar matemática*. A partir dessas três categorias, percebeu-se que os principais recursos utilizados pelos docentes entrevistados tem sido o livro didático e a internet para pesquisa de conceitos. Dentre as principais percepções e desafios está a formação continuada voltada para o uso das tecnologias digitais. No entanto, se faz necessário, repensar os recursos utilizados em sala de aula, bem como criar alternativas que atendam as necessidades dos sujeitos envolvidos e imersos em uma cultura tecnológica e assim contribuir para mudanças significativas no fazer docente no cenário atual.

PALAVRAS-CHAVE

Tecnologias digitais. Ensinar matemática. Percepções. Desafios.

El Uso de las Tecnologías Digitales en Enseñar Matemáticas: Recursos, Percepciones y Desafíos

RESUMEN

Con el avance de la tecnología digital, algunas instituciones de enseñanza como escuelas y universidades han repensado sus valores y prácticas de enseñanza. Se utilizó un recorte de investigación realizado con estudiantes de la Universidad Federal de Rio Grande - FURG, curso de Licenciatura en Matemáticas, matriculados en la disciplina de Tecnologías Aplicada a la Educación Matemática I. Durante la disciplina una de las actividades los discentes conversaron con doce profesores de enseñanza las escuelas públicas, sobre su hacer pedagógico y la presencia de las tecnologías digitales en los espacios de actuación y produjeron informes, con el objetivo de comprender el hacer pedagógico de los profesores de Matemáticas de la Educación Básica ligado al uso de las tecnologías digitales. A partir de los registros generados para análisis se utilizó el Análisis textual Discursivo (ATD) a fin de comprender el fenómeno investigado a través de los discursos producidos. En este estudio, se discutieron tres categorías que emergieron de la ATD: recursos utilizados por los docentes, percepciones sobre el uso de las tecnologías digitales (TD) y desafíos en la enseñanza matemática. A partir de estas tres categorías, se percibió que los principales recursos utilizados por los docentes entrevistados han sido el libro didáctico y la internet para la investigación de conceptos. Entre las principales percepciones y desafíos está la formación continuada orientada al uso de las tecnologías digitales. Sin embargo, si es necesario, repensar los recursos utilizados en el aula, así como crear alternativas que atiendan las necesidades de los sujetos involucrados e inmersos en una cultura tecnológica y así contribuir a cambios significativos en el hacer docente en el escenario actual.

PALABRAS CLAVE

Tecnologías digitales. Enseñanza matemática. Percepciones. Retos.

Introduction

Considering the technological evolution present in today's society, higher education institutions seek, through teaching, research and extension activities, to train citizens capable of producing knowledge, transforming their reality and emancipating themselves as subjects involved in the process of human development. them in the scientific, social, economic, environmental and cultural context. Faced with these changes, some universities, however shyly, are rethinking their courses to include themselves in the teaching and learning movement in a technological society.

For Kenski (2015, p.01) “a new culture - digital culture models the ways of thinking, acting, communicating with others, working and acting”. This new communication model enables the development of new ways of teaching and learning, changes in learning spaces, relationship between students and teachers, as well as increasingly accelerated information available on different mobile devices such as smartphones and tablets.

Digital technologies have influenced the changing habits of people who perform their activities daily through technological resources. However, how are educators and other managers absorbing, applying and adapting to the digital age? Are such actions making a difference in the education professional's doing? Studies (MORAES, 2012; GAUTÉRIO, RODRIGUES, 2017; CERUTTI, NORA, 2017) show that Digital Technologies - TD are tools that can modify a particular culture changing the ways we act in society and that need to be experienced in educational environments.

In order for technology to contribute to pedagogical practice, it is necessary to understand the potentialities of technological resources through exchange, study and exploration and, if allowed, to transform their know-how and know-how, based on DTs, and thus modify teach and learn.

In this process we ask ourselves: How is the pedagogical practice of teachers of Basic Education? Are they native or digital immigrants? Are you inserting DT in class? What are the main teaching challenges? Thus, we start from a research developed with students of the Federal University of Rio Grande - FURG, of the Degree in Mathematics, enrolled in the discipline of Technologies Applied to Mathematical Education I, which aims to understand the pedagogical practice of teachers of Mathematics of Basic Education.

In the research, the students talked with twelve public school teachers, about their pedagogical practice and the presence of the TD in the practice spaces. It was proposed to analyze the reports produced by the students using the Discursive Textual Analysis - ATD (MORAES; GALIAZZI, 2007) in order to understand the phenomenon investigated through the discourses that emerged from three components: unitarization, categorization and metatext.

In this study, from the five categories that emerged we chose three for analysis: resources used by teachers, perceptions about the use of DT and challenges in teaching mathematics. From the theoretical background of Vani Kenski (2007, 2015), Nelson Pretto (2011) and Mark Prensky (2001), among others, it is clear that most of the teachers who participated in the research use DT only for research of Certain concepts and procedures, the others do not use due to positioning contrary to the use of DT, as well as numerous limitations in planning and pedagogical practices.

Digital Technologies in the Educational Context

It is known that DT has been configured as a starting point for the development of today's society, known as the information society. Technological advancement, that is, access to the Internet, mobile devices have presented numerous benefits to users and challenges for parents, teachers and other public managers, provoking great reflections on the TD in their pedagogical practice and in their curricula, therefore, we cannot deny the existence of a digital culture, marked by changes in the way we live, relate, obtain information and produce knowledge. Universities, for their part, are trying, however shyly, to change pedagogically in order to be part of this culture and to meet new academics, also called digital natives (PRENSKY, 2001).

One of the possibilities for the insertion of technologies is digital networks, understood as virtual spaces or cyberspace, that is, the articulation between people connected with different objectives, however, cannot be seen as another resource to be incorporated into the classroom. but as possible innovations that could trigger transformation in different educational spaces. However, digital networks, according to Kenski (2015), constitute one of the goals of the National Education Plan (PNE) for schools and higher education institutions that still face the lack of

Production methodology and record analysis

Throughout the course of Technologies Applied to Mathematical Education I, offered in the second semester of 2017, we conducted an activity in which the 28 undergraduates in Mathematics produced an observation report of the school. The report was produced in groups, based on a script built in the classroom by the student collective to guide the conversation with math teachers. In this script there were the necessary questions so that we could understand the teaching time, which institution, in which space it operates and how it organizes the pedagogical practice, if it uses the technologies in its class, if it understands the potential of the TD in teaching and learning. some difficulty in using these tools, among others.

Among the eleven school observation reports prepared by the student groups, it was noted that twelve teachers were interviewed and only three use the TD in their classes to view, research and develop activities on the digital board. It was noted that seven teachers use

TD little and when this happens is to conduct research on digital networks and two teachers do not operate TD in their actions.

The Discursive Textual Analysis method can be understood as a self-organized process of construction in which new understandings emerge from three components: unitarization, categorization and metatext (MORAES; GALIAZZI, 2007). The first is the deconstruction of the corpus texts, the second is the establishment of relationships between the unitary elements according to some common emerging categories, and the third is the construction of a metatext from the capture what we understand as emerging and which is now communicated and validated. Such sequences emerge recursively according to the new understandings.

In this study, five categories emerged from the statements of the interviewed teachers, which were renamed according to the comparisons made throughout the analysis that happens through recursion, that is, going back and forth to the previous texts. This research will analyze the last three categories, which are entitled “Resources used by teachers”, “Perceptions on the use of DT” and “Challenges in teaching Mathematics”, and will present the main resources used, as well as the perceptions and teachers' challenges about the use of DT from the extracts taken from each category. It is noteworthy that to keep the identity of the participating teachers confidential, they will be identified by the letters “Pn”, where “P” refers to teacher and “n” a random number.

Resources Used by Teachers

The use of digital resources for the preparation of classes or certain activities with students has become increasingly common, since DTs are increasingly inserted in the daily lives of students, so we can not leave them outside the educational spaces. Kenski (2003), addressing the growing changes in the 21st century, emphasizes that one of the great challenges of teaching is to find the best way to use DT in the teaching and learning process according to the demands of the new times. Currently, there are many DTs that can be thought and used pedagogically, but for this it is necessary to leave the comfort zone and seek, as digital learners, continuous and continuous training (FREITAS, 2016) that discuss the inclusion of DT in the teaching action. .

The school institution, in turn, has the task of informing and preparing the citizen for the various themes that help him or her to live in society, such as the use of DTs, the school is an environment where everyone passes, or should spend time However, in their lives, teachers do not always realize that this is also their responsibility. According to Prensky's studies (2001) these teachers were probably born at a time when Information and Communication Technologies - ICT were not widely disseminated and were not part of their routine, which for the author are known as digitail immigrants.

Thus, it is possible to understand the challenges of some teachers in inserting DT in their pedagogical practices, they do not realize how much DT can contribute to teaching and learning certain procedures and often abstract concepts such as teaching of Mathematics. Thus, the school is configured in a space that may include the student who does not have access to digital networks in the technological world, as long as it incorporates the TD in the activities and thus articulates the school teaching.

In this process, one way to incorporate DT in daily activities is to use them to understand, for example, mathematical concepts present in the student's daily life. Mathematics, historically known as a science that uses only formulas, rules and algorithms, is part of everyone's life and as such needs to be understood as necessary, useful and available in the context of students. In addition, mathematics has contributed to the development of new DT through programming, mathematical logical thinking and artificial intelligence, applications that motivate students to know and have an interest in mathematics.

With the use of DT students explore software, applications and other technological resources that simulate properties and behaviors of objects or phenomena, ie, technology helps in the creation of models, simplified representations of reality. However, according to Gautério and Rodrigues (2017, p. 89) "the technological resources alone will not bring contributions and will be insufficient if used without an adaptation to the needs of each teacher in line with that of their students."

In addition, in order for technologies to broaden learning possibilities, the teacher first chooses which pedagogical resources to use to meet students' needs when teaching certain concepts. However, technological artifacts need to be thought beyond auxiliary tools in the process of building mathematical knowledge (PRETTO, 2011). These may contribute to students acquiring new mathematical knowledge in the school space through manipulation and simulation. of software.

The teachers interviewed pointed out that most of the time they use the textbook, the internet and social networks to teach mathematics as the teacher says: “(...) I use the textbook available at school” (P02), another emphasizes “(…) I use social networks to communicate with my students and to convey a new fact or to clarify possible infrastructure shortages without a network” (P10), and in response to this one gets the following speech “I use the Internet as a resource for the pursuit of differentiated activities ”(P11). We can see that most of the teachers interviewed, when choosing certain resources for the teaching of mathematics, cannot exploit all the potentialities of the chosen resources, that is, the teacher (P10) By saying that it uses networks to communicate, it ends up limiting other potential of social networks such as the informative and interactive role.

Social networks can also be seen as a learning environment since most students have access to social networks, as long as the teacher makes this space a reflection and knowledge building environment and is not tied to a single technological resource such as textbook used by the teacher (P02), but seeking constant updating. Social media such as blogs, wikis,

YouTube videos, Twitter, Skype and Facebook can be defined according to Kaplan and Haenlein (2010, p.257) as:

> [...] a set of web-based applications [...] that enable the creation and exchange of user-generated content based on interactions between people, where they create, share or exchange information and ideas in networks and communications. virtual.

Social media, as a technological resource, are present in the daily lives of students, enabling dialogue, information exchange in a shorter time, with different and low cost media. However, in the school environment there are still many resistances from teachers and managers to integrate social media into formal education. Bates (2016, p.258), speaking about social media highlights that "its main educational value has been non-formal education, such as fostering online communities of practice or (...) posting tweets during classes or evaluate teachers. "

In this sense, TD in formal education has been discussed and rethought in several spaces, such as the continuing education of educators and other school managers, in order to signal the potentialities of TD most used by students, expanding knowledge. of teachers. Technological resources must be problematized in the different training spaces so that those involved can know and appropriate TD, as well as insert them in their pedagogical practices with greater appropriation.

The speeches of the teachers interviewed reflect on the resources most used by teachers in mathematics classes, as well as the technological artifacts most accessed by students and which, today in the knowledge society, need to be part of the lesson planning. However, the challenges faced by educators who choose to work with DT need to be problematized as well as their justifications for using DT.

Next, the perceptions of the interviewed teachers about the use of digital technologies from the different realities experienced by the teachers will be presented.

Perceptions about the use of Digital Technologies

DTs are strongly present in the different spaces of today's society, facilitating daily activities. In the educational context is no different, today there are continuing education courses that can be conducted through classroom teaching, hybrid education or distance learning, all available to those who want to seek better training for teaching work. However, in some schools what one perceives is a disinterested, unmotivated faculty with no perspective of change in their pedagogical practices. Many point out that one of the main causes for the lack of interest in practices based on the use of DT is that they cannot keep up with the change in today's society, whose generations are changing almost every five years.

In this scenario, some teachers take a disciplinary and empiricist posture, because they have little or no experience with the use of DT, they prefer to remain in their pedagogical

comfort zone than to be led by what may emerge. However, it is necessary to face unfavorable situations and venture into the risk zone (BORBA; PENTEADO, 2001), that is, to challenge and think about the use of DT to teach mathematics.

In this process, when asking about the importance of teaching focused on the use of DT, some teachers highlight: “Mathematics itself does not need many technologies for its learning, in which the relevance of technologies is minimal” (P06). The teacher (P08) emphasizes: "I don't see that much need to use technologies to teach mathematics, I'm almost retiring, I don't even have the mind to learn to use technologies to help my students." Another teacher points out: “The student I had 10 years ago, 5 years ago, last year is different from the student I have today, so the technologies have to be different too and the people trying to introduce this technology have to know of such a reality ”(P11).

It can be observed through the reports of teachers (P06) and (P08), that TDs are unnecessary for the teaching of mathematics. This is because they do not master such resources and do not seek specific training for the use of computers and the Internet. However, (P11) does not use DT, but reflects on the changes that are taking place in society and the need for the school to adapt to new generations of digital native students.

Thus, access to the internet in schools in accordance with public policies has become increasingly necessary, as well as access to free software. However, continuing training is needed to serve teachers through pedagogical practices aimed at young people and adolescents who arrive in schools.

When asked what they understand by TD, teachers point out: “I think 'technology' is a very broad concept that has by definition any apparatus or facilitator of a given process. In the pedagogical field, many resources can be used as “Educational Technologies”, but the most outstanding ones are Information and Communication Technologies (ICTs) ”(P04). Another teacher points out: “I don't understand technology very much, I'm not from that time, but technology for me is all these advances that we see that help us in our daily lives” (P08). It can be observed that some teachers have used DT as resources that help their practice, others in turn cannot see DT as auxiliary tools in the process of knowledge production, so they do not develop any pedagogical activity with the aid of DT.

The pedagogical use of DT in teaching Mathematics through the use of resources such as the internet, according to Canavarro (1994), enables the classes to become more motivating, dynamic, modernized, facilitating and to generate changes in pedagogical action and in the relationship between teacher and teacher student. In addition, there are other digital technologies that can enhance learning, however, it is up to the teacher to take a stand against the reality experienced by students emerged in a digital culture.

For Pretto (2011, p.8) “(…) both the internet and the TD in society, in school, in general education, are seen as elements that contribute to a radical change in education as in contemporary society”, because the The use of DT has facilitated and transformed the culture

of each subject. The use of DT linked to the teacher's teaching method contributes to a better learning, because if it is not open to changes in their teaching practice, they will not be able to change their posture, according to the teacher's speech (P04): " (...) it makes no sense to use these technologies without presenting a different methodology from those we use in our daily classes ". Many teachers, as is the case of the teacher (P04), have different conceptions about the use of digital technologies, their limits, possibilities of use, need to be established and dialogued between teachers and students in order not to generate confrontation but alternatives use. According to Ribeiro (2005, p.94), "the machine needs human thinking to become an aid in the learning process".

In this sense, in order for the school and other educational spaces to be in line with the growing technological changes, it is necessary that they seek the articulation between the approached content, the student's context and the use of DT through a class planning that contemplates the specifics of each class. However, teaching and learning in a technologically evolving society becomes a challenge, as will be discussed in the next section.

Challenges in Teaching Mathematics

The school is currently undergoing transformations in the way it has produced knowledge and these transformations have been caused by the growing technological evolution. This, in turn, has caused a change in culture, which has provided greater access to information through speed of information, communication, comfort and mobility. In addition, teachers and students have had greater access to different technological equipment available at home and in the hands of teachers and students across the country through mobile technologies.

For Moran (2014, p.464) "the arrival of mobile technologies in the classroom brings tensions, new possibilities and great challenges. The very words "mobile technologies" show the contradiction of using it in a fixed space like the classroom ". Mobile technologies are increasingly available in the hands of students and teachers, making it possible to use these resources for educational purposes.

In this process, the teachers interviewed when asked about the challenges for the development of their teaching work, one teacher highlights: "the main challenges in the use of technologies is that the school has little resources, my lack of preparation, the students' interest in technology and class dynamics is what I believe helps to make the class different and more engaging"(P02). Another teacher points out "(…) whenever I try to use the technologies I encounter in the absence of equipment maintenance and this makes a class in this way even more unfeasible" (P10). Another educator mentions: "(…) the internet is scarce, there was also no preparation of teachers, which resulted in little use of equipment" (P11).

We can see from these lines that one of the challenges is the lack of appropriate

infrastructure for the development of activities and also the training of educators to deal with digital technologies. According to the 2013 ICT Education Survey conducted in public schools across Brazil, there was an increase of (71%) in schools with WI-FI access. However, the connection is still a challenge, especially considering the need for simultaneous use of equipment in the same school.

Such information is in line with the reality of the teachers interviewed, since it is no use having internet access if the connection is low, or having computers that do not work due to lack of equipment. One teacher points out: "(…) the activity was very difficult to develop, because the classes were large, and there are few computers, so there were two or three students per computer" (P08). According to the 2013 ICT Education Survey "The average number of desktops in operation is 19.1 for an average number of 653 students per school, which can be considered a limitation for the pedagogical use of TD" (VIANA, 2016, p.465).

Many teachers end up giving up developing a class with the help of computer and the Internet for lack of resources, others start using mobile technologies, ie, rather take your notebook than rely on the school computers. Also, in many schools teachers are using smartphones for class development. The results of the ICT Education 2013 survey, related to infrastructure, indicate an increasing tendency to use mobile devices as a tool for formal education.

Another challenge mentioned by the teachers interviewed is the lack of specific training for the use of DT for pedagogical purposes, as the teacher says (P08): "(…) on the day I was nervous, but the students themselves helped me where I did not know move ". This teacher felt nervous about not mastering the chosen technological resource, but one of the potentialities of the use of DT is in providing opportunities for interaction and the exchange of experiences between those involved, which makes the class enjoyable.

Another teacher points out: "I have great difficulty in adapting the Mathematics contents that I teach to technologies" (…) I leave in search of a formation that prepares me more in this sense, specialization and master's degree, but, to my frustration, I still don't know how to apply it. Mathematics contents using technologies "(P04). We understand that it is not enough to take a single training course for educators, since every day new forms of teaching and learning arise from research developed with new educators and students.

According to Gatti (2010, p.01 and 02) "teacher education has been one of the major challenges for educational policies, [...] in Brazil's higher education we have not had a strong enough national initiative to adapt the curriculum to the demands of education ". In this context, the issues of undergraduate education as well as continuing education need to be among the priorities in discussions about curriculum and practices of insertion of undergraduates in the school context, so that they have greater clarity on the challenges they will face.

One teacher mentions: "(...) there is not much time left to study a little deeper to find ways to work with students, I miss some courses that help how to apply technologies" (P11). Through this speech, we can observe two limitations: the lack of time for class planning and the lack of continuing education that must be rethought among the teachers themselves and managers in order to develop, as Gatti (2010, p. 01) points out " (...) aggressive actions in the educational area, especially taking care of the formators, (...) the dissemination of knowledge and substantial elements of culture ". Among these actions is the time for the planning of classes directed to the culture of students and use of DT.

DTs are increasingly available to all, but the pedagogical use of the internet depends solely on teaching creativity, research on new ways of teaching and adapting to students' reality, which will require

> [...] planning, investigation, adequacy of spaces and times to the reality of the students and the contents to be taught. It takes time, dedication, constant evaluation, cooperation and a lot of communication between all involved. It takes political will from the leaders of all levels to ensure the viability of flexible and innovative educational projects. (KENSKI, 2015, p.13)

Finally, the teacher (P11) points out: "(...) I miss some courses that help how to apply the technologies". However, it is not what the courses aim for a teacher in continuing education, that is, that only reproduces the activities covered in the course, but that from what was discussed in the courses can adapt and expand the activity proposals to their reality.

In addition, the teachers' report points out some challenges in teaching mathematics from the TD at school, from school infrastructure, continuing education directed at school reality to educational public policies. The process of teaching mathematics today is increasingly required, involvement, dedication and planning, so that there is a greater production and transformation of knowledge.

Final Considerations

Based on this study, which aimed to understand how teachers of Basic Education Mathematics are inserting in their pedagogical practice the TD and what perceptions and challenges these teachers have been experiencing when choosing to teach Mathematics with the aid of TD, it was perceived from the extracts From the teachers who participated in the conversation with the undergraduates, the need to rethink the resources used in the classroom in order to meet the digital natives, because the choice of these resources should contemplate the culture of these students. Reflecting on the ways students are communicating, relating and interacting is of fundamental importance to their learning, mainly because they are immersed in a digital culture focused on the use of digital resources.

Also, the need to discuss in the educational spaces about continuing education courses focused on the use of DT and time for class planning in this context, for teachers, has been

one of the challenges of current education. However, what is needed, based on the main needs presented along the lines of teachers, is to create concrete and favorable conditions that meet the demands of each community, as well as students and teachers.

For this, of the three categories discussed, the first entitled "Resources used by teachers", showed the resources used by all teachers interviewed, among them the textbook, the internet, social network and software. The second category entitled “Perceptions about the use of digital technologies”, is the speech of teachers who do not use DT. Some teachers understand TD as unnecessary resources for student learning, others do not understand and do not know how to use TD and because they are close to retirement, they prefer to follow the same teaching method and resources. The third category titled “Challenges in Teaching Mathematics” presents some challenges such as school infrastructure, lack of available computers, low wireless access, little school incentive for continuing education courses and little time for assisted lesson planning from TD.

It is noticed that of the teachers who participated in the conversation with the undergraduates, most use the TD to research certain concepts in digital network. It is understood that this action is caused by the lack of knowledge about the potential of DT in and for education, not allowing itself to be used in a pedagogical way. The other teachers who do not use or little use, justify their choices because they do not have continuing education for use of the computer and the Internet, for not having an adequate infrastructure for teaching work and for not having time for class planning with technological resources.

However, given the situation experienced by many teachers and managers of basic education and higher education, reflecting and creating alternatives to the advancement of DT is an alternative way for educational changes directed and focused on the reality of students. Today knowing how to use the computer and the internet is the minimum for the teacher who wants to teach children and young people immersed in a digital culture. Thus, it is important to reflect, as well as understand the position of some teachers who prefer to follow the same teaching practices of decades ago than using the TD as potential tools for teaching and learning.

Thus, the pedagogical use of DT needs to be constantly discussed in the school spaces and in the higher education institutions, which form education professionals, so that a new culture is constituted, permeated by changes in the way of teaching and acting as subjects. In addition, look and see the possibilities of teaching through DT, that is, create a culture of learning through different spaces, not only limiting the classroom as a physical space, but think of alternatives, because currently maintain a A classroom with internet access or computers connected to the internet, as well as other resources needed for the educational environment, has become increasingly difficult in the face of educational policies. Therefore, it is from the questions, challenges and perceptions raised in this study, by mathematics teachers will seek in different contexts, enhance the teaching and learning in the current times.

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