

**Investigaciones y Experiencias**

Desigualdades tecnológicas educativas expresadas durante el encierro por COVID 19

Educational technological inequalities expressed during confinement by COVID19

Antonieta Kuz¹;

¹<https://orcid.org/0000-0002-8696-0859>; Universidad Metropolitana para la Educación y el Trabajo, Buenos Aires (Argentina); kuzanto@hotmail.com

Doi: <https://doi.org/10.21071/edmetic.v11i2.13657>

Recibido: 22/10/2021 Aceptado: 10/07/2022 Publicado: 01/08/2022

Citación:

Kuz, A. (2022). Desigualdades tecnológicas educativas expresadas durante el encierro por COVID 19. EDMETIC, Revista de Educación Mediática y TIC, 11(2), art.5. <https://doi.org/10.21071/edmetic.v11i2.13657>

Autor de Correspondencia: kuzanto@hotmail.com

Resumen:

En Argentina, en marzo de 2020, se suspendieron las clases presenciales para evitar la propagación del covid-19 con una cuarentena prolongada. El diseño de este trabajo busca conocer algunos de los factores que operan en el origen de las desigualdades tecnológicas preexistentes. La información se obtuvo mediante un diseño cuantitativo con 290 alumnos durante el año 2020 en Buenos Aires combinado con uno no experimental con alcance descriptivo, de carácter exploratorio mediante entrevistas a 3 docentes. Combinando ambos análisis encontramos hallazgos relevantes sobre las desigualdades socioeducativas, con énfasis en lo interpretativo-descriptivo de los problemas y vulnerabilidades preexistentes a la cuarentena

Palabras clave:

COVID-19; Desigualdad tecnológica; docentes; alumnos.

Abstract:

In Argentina, in March 2020, face-to-face classes were suspended to prevent the spread of the covid-19 with a prolonged quarantine. The design of this work seeks to know some of

the factors that operate at the origin of pre-existing technological inequalities. The information was obtained through a quantitative design with 290 students during the year 2020 in Buenos Aires combined non-experimental with descriptive scope, exploratory in nature through interviews with 3 teachers. Combining both analyses we found relevant findings on socio-educational inequalities, with an emphasis on the interpretative-descriptive of pre-existing quarantine problems and vulnerabilities.

Key words:

COVID-19; Technological inequality; teachers; students.

Introducción

Recently, the infectious disease caused by a Coronavirus (COVID-19) has given rise to a process that has spread in many countries and regions and that has been maintained and persists in time, attacking almost all individuals of a region locality or region. The pandemic caused the already unstable economies to worsen the situation, leading to the precariousness of formal employment and throwing the economically active population into informality. This pandemic has had negative effects on the health and life of a large part of the world's population due to border closures, human losses and economic effects.

Being a rapidly spreading infectious disease, it has created serious difficulties for the health systems of many countries, even the most developed ones. Moreover, the virus began its effects in a country like Argentina with an alarming social context of vulnerability and marked social inequalities. Social inequality is a structural problem that can be seen in different spheres of our daily lives. It negatively affects communities, groups and in particular the school, teachers and students. Among some measures that were taken in the countries to contain its progress was the closure of educational establishments at all levels, and Argentina was no exception. During 2020, Argentina went through an abrupt and unexpected and prolonged suspension of its face-to-face academic activities. Argentina, during the quarantine, tried to take measures to lessen the impact of these multiple adversities, economic and unemployment, but due to the precipitation of the events, the time to plan the social isolation of school students was limited both for public schools as private. In this answer to inequalities, students in the most vulnerable situations, were exposed and relegated to government decisions that weighed the risk of contagion over the diagnosis and characteristics of social inequality in the access to educational and technological resources of public sector students.

In this article, we focus on the experience of teachers and students on inequalities in the public and private spheres. We propose an integrative view through the articulation of a qualitative and quantitative investigation that accounts for a pre-existing structural poverty of the current pandemic that aggravates inequalities in the educational quality of students at the secondary, tertiary and university levels.

Referential Framework

Educational context in Argentina

In the current situation, fragmentation is a characteristic that we find in many areas, especially in education, for which, it is necessary to think, they are dreams and objectives so that the desire for social transformation stops being a utopia and becomes reality. In this sense, we understand that teaching necessarily implies learning: learning how to specify ideas, carry out strategies, plans and possible actions. Also, how to collectively build new teaching-learning modes that take into account an educational transformation that includes the use of ICT in the framework of the educational context of the 21st century.

Common sense often blames the school for the successes and failures that occur in a postmodern society, demanding the alleged solutions to problems of different kinds from education. Grimson y Tenti Fanfani (2014) in their work they analyse certain ideas that common sense builds, which become contradictory when Argentinians look at the classrooms. Certain discourses affirm that the classrooms are the culprits of all the problems, and at the same time, and in a contradictory way, the magic solution to all of them. These authors maintain that these types of phrases are: "formulas that imply deep simplifications and leave no room for grays or relativizations" (p.17), being that "it is impossible that the current school can satisfy a large part of the expectations that society places on it" (p.20).

Advances and frolics mark ups and downs in education in Latin America and in particular in Argentina, giving rise to heterogeneous and uncertain scenarios, giving rise to an educational system that becomes inadequate for the circumstances or needs of a certain moment. The Argentinian educational system is massive, compulsory and expanded throughout the territory. This implies that there are more and more boys in state-run schools, but they learn little and there are more and more teachers, but the average salary is low. Each advance in the last twenty years of Argentinian education is related to public policies that are not effective in terms of both results and continuity.

This reality is reflected in the annual report of the Observatorio Argentinos por la Educación (2019) which analysed from a perspective of five large dimensions: access, internal efficiency (repetition, effective promotion and progress in expected age), human resources, financial resources and learning outcomes among others. On the one hand, in terms of access, almost all elementary-age students who go to school enrolment are close

to 100%. Regarding secondary education, despite being compulsory since 2006, one in ten adolescents is still outside the system. On the other hand, regarding school trajectories, there is a clear drop in enrolment due to the difficulty of sustaining school trajectories. In primary school, learning is more solid than in secondary school, the socioeconomic level factor continues to be the most determining one when it comes to predicting the quality of learning. In all subjects there is a difference of between 25 and 30 points percentages in the performance of young people from more and less favoured households. In addition to the students, the central actors of the Argentinian educational system are the teachers, who represent the hardest hit link in the chain, given the low salaries and the multiple factors and problems that they must face, such as the emotional containment of the students, in some cases food, painful educational infrastructures, corruption in the assignment of positions, and laziness.

Pandemic and the effects of the quarantine on Education and Inequalities

The relationship between the public and private educational systems and inequality in Argentina is complex, and it expands at all levels of the school system in organizational, curricular and operational conditions. Among the causes that converge educational inequalities are specific; political and social and economic conditions. Argentina is a country crossed by volatility in economic growth that impedes the development of the country in the long term, implying degrees of high poverty that leads to persistent social inequalities. According to the Banco Mundial (2020):

The level of inequality in a country is an important dimension of well-being with important consequences for a country's ability to reduce poverty. Although inequality is used in a wide variety of contexts, the most common concerns refer to the distribution of income within the population of a country. This is an important dimension of well-being, since it takes into account the differences in income within the entire population, unlike other indicators of well-being that they only focus on one particular group.

In keeping with Tuñón and Halperin (2010) inequality in access to educational resources translates into little informal sociability among students from different social strata and in the growing process of isolation of the most impoverished sectors of the society, understanding that the schools attended by students from a lower socioeconomic level tend to be of poorer quality than those attended by their peers from the middle and upper-

middle professional strata, given the situation of the pandemic and the effects of the prolonged confinement. According to that, in the theses of Monserrat (2017) works on inequality of educational opportunities in Argentina, combining empirical strategies to characterize, analyze and provide measurements of inequality and obtaining distributions of educational results and the factors that generate it. He focuses on the educational differences between schools of public management and private management that give rise to inequality of opportunities if the educational quality is higher in private schools and access to them is linked to the family's socioeconomic level. In accordance with UNESCO (2005), inequality and consequently the digital divide is related to factors such as: economic resources, habitat or geography, age, sex, employment. This implies that the analysis of technological inequalities, given their multiform nature, the analysis is not limited to a strictly technological solution.

Regarding a study by Renabap (2018), there are 952 vulnerable settlements out of the 4,228 that were counted up to that moment throughout the country. Of those almost 122 were in La Matanza, 80 in Moreno and 70 in Florencio Varela, with which there is a great concentration in the Buenos Aires suburbs. Taking into account the report of the Observatorio de la Deuda Social Argentina (2020), only one in ten students from vulnerable homes were able to connect with their teachers through a platform and this leads to projecting increases in dropout and increasing overage. Furthermore, it can be seen that while in the highest socioeconomic stratum 72% of students were able to continue with their classes through educational platforms, only one in ten were able to enter a virtual classroom among the poorest students. This situation, which relates the socioeconomic level to poverty, implies, on the one hand, that the most advantaged students, according to the report, have six times more chances of connecting through platforms than the most disadvantaged. On the other hand, in the lower socioeconomic strata, the most important tools to have pedagogical continuity were social networks, such as WhatsApp and Facebook. Transferring these inequalities to education in Argentina, according to the *Observatorio Argentinos por la Educación* (2020b), 37 out of every 100 households do not have access to fixed internet. At the primary level, one in five students do not have access to the internet, and neither do 15.9 percent of students who finish high school.

Quarantine that has been established in Argentina and other countries in the region as a preventive measure against COVID-19, has led to families being confined and adopting new forms of organization and coexistence. The COVID-19 pandemic has two significant impacts:

the closure of schools at all levels and the economic recession generated by the pandemic control measures. Argentina began the sequence of quarantines and restrictions as soon as the school year began. Indeed, after the sanction of the Preventive and Compulsory Social Isolation, the Ministerio de Educación de la Nación (2020) through resolution 108/20 established the suspension of face-to-face classes.

A strong report marks a digital division that is evident according to the Report of the *Observatorio Argentinos por la Educación* (2020c) 9 out of 10 students in the private sector have Wi-Fi or broadband at home, while in the state sector there are only 6 out of 10. A noticeable difference is in the use of WhatsApp, which ranks 6th in use in private schools (68.0% use it always or sometimes) as opposed to 1st place in public schools (92.2% use it) use always or sometimes). According to a report from the national Ministry of Education (2020), 58% of boys in state secondary schools do not have access to a computer. For those who attend private institutions, the figure is reduced to 21%, thus marking that the contexts of vulnerability are those where the school is most necessary and due to the crisis that ends up having a huge negative impact in terms of learning (see Figure 1 and 2), since connectivity is not a possibility for everyone.

Figure 1. Households with access to a computer Source: Ministerio de Educación and UNICEF (2020)

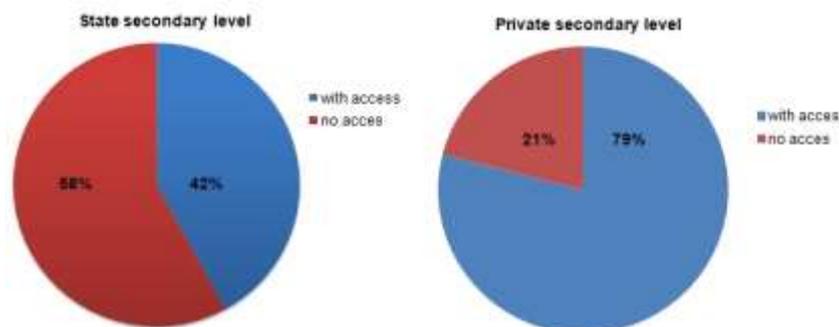
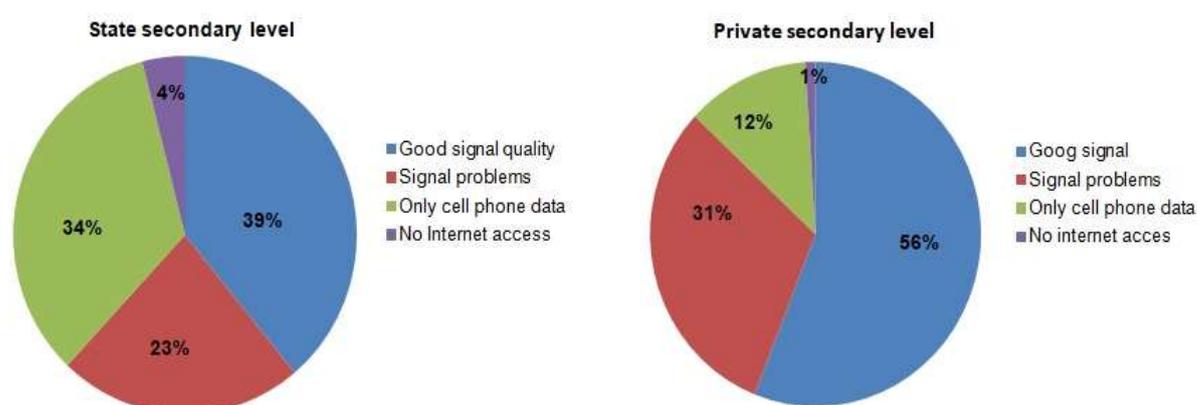


Figure 2. Households with access to a computer. Source: Ministerio de Educación and UNICEF (2020)



Methodology

Confinement and educational establishments remained closed throughout 2020, and however, the context has expanded and continues as this report is published. The research carried out combined quantitative and qualitative, through a systematic integration of methods in a single case since it allows us to deepen the data obtained (Maxwell & Loomis, 2003). Both methods have been complemented and integrated throughout the design, selection and data collection, analysis and research results. A triangulation will be carried out between the data obtained to validate the results achieved in the study from different perspectives. Considering the quantitative and qualitative methodology, we can get a higher knowledge of the phenomenon to be studied, since both are collection techniques and information analysis. On one hand we consider a questionnaire to be completed by the students and the valuation of the subject subjects study and, on the other, an interview with teachers. A triangulation between the data obtained for validate the results achieved in the study from different perspectives. Triangulation seeks as a tool the application and combination of several research methodologies in a study to compare different types of data analysis (analytical triangulation) with the same objective, it can contribute to validate a survey study and enhance the conclusions drawn from it, derive them, allow us to take advantage of the strengths and mitigate the limitations or weaknesses of each one of them, cross data and observe to obtain conclusions, combining qualitative methods or quantitative research measures

To address the proposed objective, this research was, on the one hand, framed in a qualitative paradigm, through a case study design, given its intention to provide a comprehensive and in-depth look at a certain reality. The information was complemented with a questionnaire of closed questions to a group of 290 students from private and public

management to validate technological elements of analysis that denote the digital divide. For the qualitative session teacher's interview deepened the understanding their subjectivities and reflection. It was also sought to collect the perceptions about digital division, through interview sessions with open questionnaires, through a self-application agreement with the participants. To obtain the information gathering instruments, due to the nature of the study and the type of information required, questionnaires were designed, for the teachers with open questions, in sessions carried out via zoom or via chat during 2020.

Study subjects

On the one hand, we must sample the participants identifying the actors that can be selected, in our case, the scenario (see Table 1) presents a group of 290 students out of a total between 14 and 27 years old, 191 are from private university level and the rest are 13 from public management tertiary and 86 of the secondary public level. Both groups of participants came from Buenos Aires capital and the Buenos Aires suburbs. With regard to students, the type of sampling used for the selection of the sample has been non-probability sampling, in which the selected sample obeys to the criteria of the researcher himself.

Table 1. Characteristics of the study population. Source: own elaboration

GROUP	SOCIOECONOMIC	AVERAGE ACADEMIC PERFORMANCE	AVERAGE AGE
290 students	Medium to low Urban demographic context, determining difficulties in access to participation in technological development, and many places this makes access impossible	Mean	14-27 years old young people mostly use technological innovations and their applications

We selected 3 teachers were a 36 year old female of a secondary-level teacher and 2 males between 45 and 49 years old of the tertiary and university education system, who have several years of seniority in their work. The selected professors represent an image of the Argentine professors of today, taking, into account the information about the general characteristics of the teaching staff, where the teaching profession is predominantly female and an average teacher is 36-45 age range, and lives in the suburbs (Cardini & Sánchez, 2020). For the sample of teachers, we consider a sampling through a selection of particular subjects who are relevant sources of information for the research, and we will use an opinionated and intentional sampling. In our case, the key informants will be those teachers who taught the subjects at different educational levels. The selected professors will provide us with: Detailed information due to their knowledge and experience in the subject to study; Once the results of the questionnaires made to the students have been obtained, it allows us to know, inquire, find out, possible interpretations of said results as well as reinforce or contrast the information between teachers and students regarding their perceptions and intentions, knowledge, uses, motivations, and needs.

Questionnaire

The questionnaire, as an information collection technique that was used as an instrument, seeks to standardize and integrate the data collection process on the variables that will allow knowing the current situation in which the study population is found. Moreover, to evaluate its quality and that we will develop later we will take into account considerations such as; its validity, reliability or practical utility. In the questionnaire we will focus on knowing from the point of view of the target students' study for this reason we ask the students who will value 6 aspects in relationship with technology such as equipment etc) has been adequate to develop the course content. To know the probability of possible error in the configuration of the instrument we will use the validation, specifically through the method of individual aggregates. The instrument that was used to collect the data was a questionnaire to the students that was divided into the following categories that specify the dimensions of the analysis. The following variables were considered: V1: students' conceptions about educational technological resources and V2: students' conceptions of economic resources. The categories and dimensions of the variables V1 and V2 are shown in Tables 2. The instrument that was used to collect the data was a questionnaire that was disseminated through WhatsApp, for which it was designed. Questions were elaborated from the objectives of this study, and the questionnaire was answered in the year 2020.

Table 2. Dimensions and categories of variable factors associated with inequalities. Source: own elaboration

VARIABLE	DIMENSIONS	CATEGORIES
V1=Educational technological resource	Do not have access to computers or share computers with a family member High costs of telecommunications services and internet services	To access the internet do you use a Fixed Broadband Connection or a data plan of my cell phone company? To take my subjects do you use a Notebook, cell phone or desktop computer? Do you have a web camera? Do You have a microphone?
V2=Economic recourses and Employment	Difficulties where one or more members of the family group are unemployed. Students find impossible to purchase books or didactic materials and photocopies or an own cell phone	Are you currently working, you or someone in your family? Do you share the device with another member of your family?

Interview

For qualitative research, an individual interview was used semi-structured, characterized by flexibility, including questions in depending on the way in which the interview. In order to delve into the data provided by the students through the application of the described questionnaire and compensate for possible limitations, we will carry out the construction and application of the interview, since there are different sources of biases that can affect the quality of the interview information collected, in our case, we will use the interview, to obtain information that allows a reflective and critical contrast.

Likewise, we seek that the qualitative results and quantitative converge, confirm mutually and seek to reach a more comprehensive approach. As an example, some of the questions asked to the participating teachers are presented: Did you feel that the managers accompanied you in this situation of uncertainty, or did you feel alone? Do you have a computer that you can use exclusively, without having to share it with others in the home?, What was the weekly contact with your students ?, Why did they consider WhatsApp as a viable tool to achieve the teaching-learning process ?, which is the tool you think with which they connect students, etc. Furthermore, we have incorporated a narrative testimony as a qualitative methodological instrument (Serrano, 2009). The purpose of this work is to investigate the discussions around the testimony and its privileged place by capturing the voice of a teacher who is witness and narrator of events (Vasilachis de Gialdino, 2006). We work with in-depth interviews as a qualitative methodology technique, asking a teacher about her experience during classes (Fernández Carballo, 2001). Through the interview to the teacher, we seek to have a diachronic and chronological perspective through the life trajectory of the teacher and the experiences of people throughout the period of the pandemic. For this purpose, we work with a semi-structured interview, where we prepared a thematic script and the questions that are asked are open. The teacher can express her opinions, qualify her answers, and even deviate from the initial script thought by the researcher when emerging issues that need to be explored are glimpsed.

Results

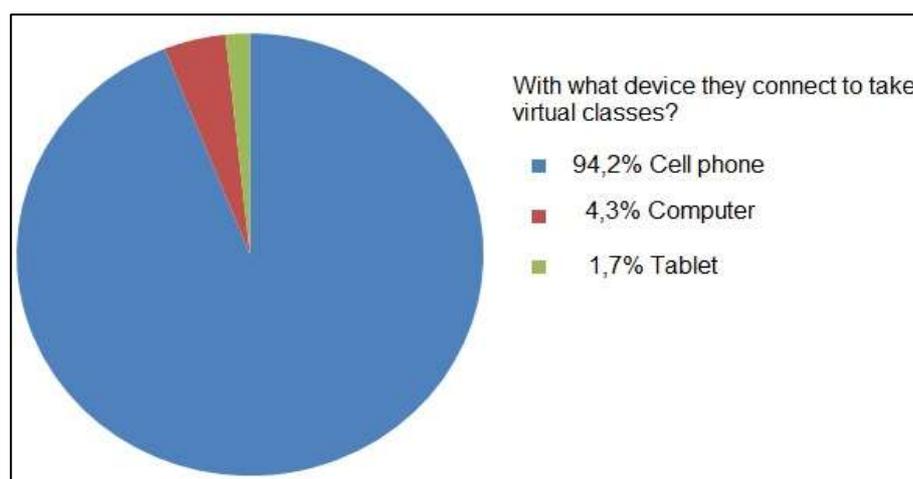
Analysis of the questions to the students through the contrast with the teaching opinions

When we analysed the data, there are different levels of inequality, because it not only implies having Internet at home, because although there is connectivity, many times the

only tool to access classes is the cell phone. The scenario of the students of the Buenos Aires suburbs is posed with situations of vulnerability where large families live in tin and wood boxes with dirt floors, and some have tarps on the roofs held by tires. In this type of context, no one can connect with the school since there is only one cell phone at home, but no connection, given that, in most cases, no member of the family has a job and they also do not have money to put credit on the phone.

From the descriptive analysis of the data extracted from the students of the secondary level we can see in Figure 3, when faced with the question, with what device they connect to take virtual classes, 94.2 % of students carry out their activities with their cell phone 4.3 % use computers and only 1.7% use a Tablet. In addition, 76.8 % of the students do not use email and 23.2 % do not have one. From these values and percentages, one might think that the students are not interested in using the email and that lack of interest is given by the fact that they do not need it. They have no motivation to do so, therefore they do not care if they have mail or not, they do not care to check it and they usually lose the passwords. And this situation is exacerbated by the scarce possibility of accessing a digital device, as we see; only 3.4 % have computers. It can also be stated that the use of the cell phone is with an asynchronous pedagogic mode, due to the scarce availability of the cell phone (in most houses there is only one phone and it is used by one of their parents).

Figure 3. Percentages that reflect high cell phone use in the secondary in the secondary of state management.



At the public level we can see through the survey that when asked if they share the device with another member of their family, 50% of the students surveyed do so. In addition, 100% of the students from public establishments answered that they share devices with a member of their family. Moreover, to access the internet 80% of the students have a fixed broadband connection, and before the consultation to take the subjects they use, 80% of the students selected the option Notebook/Netbook at the private university level. Also, we see in the numbers surveyed that 70% of the public tertiary students use the data plan of the cell phone company to access the internet.

Therefore, the data that we have presented allows us to get an idea of the state of affairs as if it was a photograph, in the middle of the measurements of prevention and physical isolation applied in Argentina, influenced directly and untimely by the ways in which students faced the 2020 teaching-learning process and socioeconomic and family problems. The scarcity of digital connectivity and computers hinders pedagogical continuity and most of the consumptions are via cell phone and using telephone data, which makes them more expensive at a critical time for the informal economy. The situation of connectivity and that many families have a single cell phone that they share among all members, is a daily problem for students, generating a digital division and violating the right to education, since there is great difficulty in accessing to all the educational content.

Both teachers state that there is a classification in three social groups, the most advantaged of society have classes almost regularly through platforms where they meet their classmates, a second group tries to continue with the support of their parents, relatives or social organizations that accompany them, and a third group of students did not have the possibility of receiving their education at home. In private schools, according to what was reported in both teachers interviewed, they make a great effort to maintain the learning processes and with which their high commitment stands out. They have had to update in the management of online tools, in the elaboration of resources as well as in maintaining the rhythm of student learning by adapting the material of each course. In addition, teachers observe that private school students have greater access to devices to be able to sustain pedagogical continuity remotely and, at the same time, have more and better options to connect, this is confirmed by the survey carried out before the consultation.

Likewise, the teachers' opinion expressed is that the crisis is exacerbating the existing vulnerabilities and inequalities that students experience. Moreover, the teachers express

that the general principles of pedagogy continue to be valid in the context of remote learning, but they are presented with additional challenges from the emotional and psychic effects of students and teachers, like frustration, tiredness, discouragement, leading to absenteeism and repetition, due to online student frustration caused by serious or repeated problem situations. The teachers express that it is a fact that perhaps there are problems exacerbated by the confinement and the precarious socioeconomic conditions. In the case of zoom, both in public schools, at the university level and in private and public secondary schools, it is widely used as stated by both teachers. The difference is that in the private school they pay for the use of licenses, in the public case, this is not the case, so after 40 minutes the tool is disconnected, causing problems for teachers and for setting up classes.

Another problem that teachers manifest is that there is not enough internet coverage, or price gaps in providers, that students cannot pay or cannot afford. Moreover, in both teachers stated that they are exhausted, especially in public schools since they have to correct blurry photos (see Figure 4) or receive messages late at night, for example at twelve, to solve doubts and students, in the case from high school, who are burdened by so much homework it is made difficult by the lack of links with teachers.

In addition, the private university professor stated that the university was already prepared for a virtual campus (see Figure 5) and that after the quarantine was established and assuming that it is a transitory and emergency, it began to work quickly to have all their subjects in the virtual environment. In this case, the move to remote teaching was smooth given the rapid training of teachers and the incorporation and dissemination of the use of programs for the delivery of courses. But the situation faced by the private university according to what was stated by the teacher is the situation of confinement that generated a low enrolment of students, which affects the financial sustainability of the careers and the closure of subjects, since in, some cases, the students expressed the difficulty to pay the fees during the context, due to unemployment of one or more of the family members. As for the public tertiary, the situation was a little more complex given that the subjects were designed in virtual format, given that they did not have a virtual platform, depending on the great diversity of academic units and programs that each faculty can decide to establish how to establish the format of virtual activities. Other additional question detected in the interview with the teachers is the impact of isolation and the passage to virtual is uneven, since there are teachers who are used to remote work at the university level since many

careers were already taken at distance, but others had to quickly learn to work and teach their courses virtually as in the case of secondary and tertiary level.

An estate on which it is based on technological inequality is the economic factor and consequently poverty, since in many homes no members of the family work. According to both teachers, the lack of economic resources affects not only the possibility of having technological resources but also the lack of books at home, as well as the lack of adequate space at home to study or have means to buy school supplies. As we can see in Figure 6, a task carried out in an activity book sent by the virtual platform to the teacher in charge.

Figure 4. Image of one assignment made on paper and sent by WhatsApp to the participating teacher for her to correct. Source: Teacher participating of the research

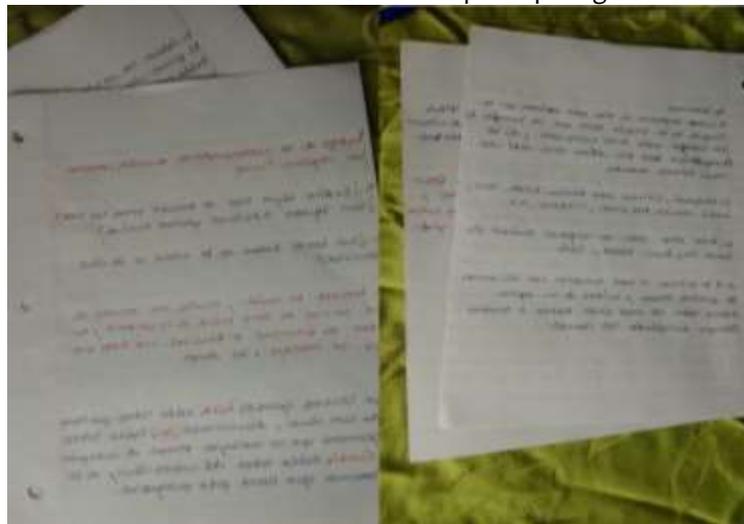
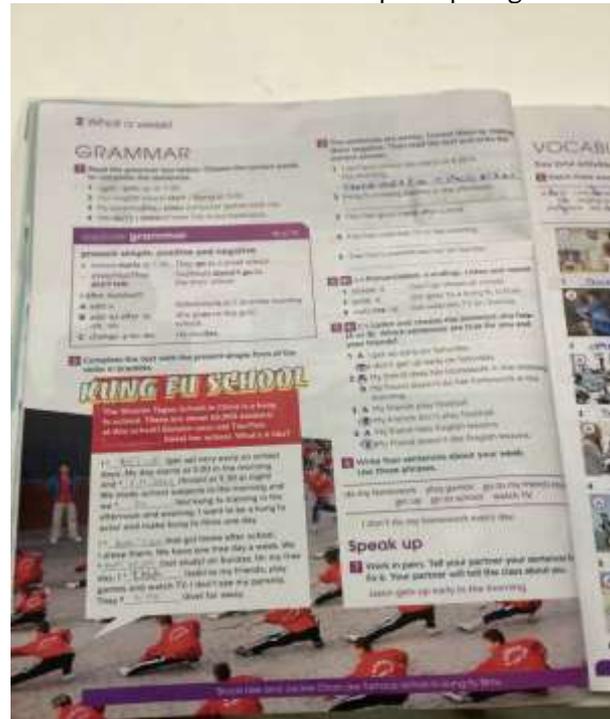


Figure 5. Virtual private university platform. Source: <http://campusvirtual.umet.edu.ar>



Figure 6. Image of one task made on a workbook sent by a virtual platform to the participating teacher for correction. Source: Teacher participating of the research



Discussion

Virtual classes highlight the existing inequalities both for students who need equipment and an appropriate environment without distractions such as for teachers who have the same requirements together with the overload of tasks and the scarce time-space of rest for the preparation of classes since they are the same teachers who teach both in the public and private sectors. Validating Monserrat (2017) in his thesis as it was before the Pandemic, inequality was problematic since he obtains empirical evidence on inequality of opportunities between schools of public management and private management from a non-parametric analysis to achieve a better understanding of the existing educational inequalities. Then we can transplanted that pandemic accentuated the differences between public and private education, we can see that the differences highlight something key, the access to electronic devices and the connectivity of students in public and private education. The health emergency has exacerbated existing disparities in education, and prolonged school closings could reverse some of the gains made.

Also, we can see that the teacher has a more complex role as a facilitator of learning, through the use of technology because it enhances autonomous and selective access to information so that students acquire active, creative and critical thinking about it, so that the information becomes a true personal knowledge. In agreement with the research of Barberá (2003) the teacher assumes a role that only he can do. Now it facilitates learning because it enhances autonomous and selective access to information and not only by ensuring the quantity and quality of sources, and the role of the teacher becomes more complex, since it requires a greater integration of sources, content and educational objects,

shifting the emphasis of their teaching task from presenting the information to assisting students so that the information becomes true personal knowledge.

We can consider that this study is limited to a single interview with two teachers, and a group from tree particular school, and this limits the scope of the study. But we can see in general terms that during the quarantine, technological inequality was superficial, validated by the opinion of the teachers. This reason arises because before the pandemic, teachers did not frequently use technological devices in class and students did not have access to the necessary knowledge to take advantage of the tool and teachers had many difficulties using them.

A related work that we found is that of Álvarez et al. (2020) in which they express the educational segregation in Times of Pandemic and the balance of the Initial Actions during the Social Isolation by Covid-19 in Argentina. In it they detail an approach to the management strategies that were developed in the context of mandatory isolation. Another article that we found is that of Formichela and Krüger (2020) where they analyze and make a reflection from the Economics of Education in the context of Pandemic and the changes in the Argentine educational system from the appearance of the pandemic, analyzing the potential effects on educational equity, as well as the economic, social and educational policy measures adopted, and the scope and effects they could have on equity in basic education.

Another related analysis is that of Lugo et al. (2020) in which they consider educational policies as unclear and evident, and as the new situation of the COVID-19 pandemic has put to the test, the proposals for educational digital inclusion in Latin America. We also find another work, that of Preti and Fernández (2020) analyses the educational reality and the policies that the Argentine state launched as the "We continue to educate" program aimed at sustaining, through virtuality, the pedagogical link with the students of all levels of education, realizing the inequality between social sectors to access and sustain educational continuity through ICT, with a state that seeks to narrow the gap by widening its compensatory public policies, but faces structural problems that in the current context global and national and unlikely to be reversed in the short term. We also find the work of Expósito and Marsollier (2020) in which they analysed and explore the strategies, pedagogical and technological resources used by teachers in the virtual education model implemented during preventive confinement, and the analysis of the data showed the existing inequalities regarding the use of technologies and digital pedagogical resources and these differences are manifested in relation to the type of management, the educational level, the socioeconomic situation of the students, the academic performance and the support by the student's family. After the pandemic and the suspension of face-to-face classes, the parameters of education have been abruptly modified. The face-to-face link between the student and the teacher has not been present, nor between the students; and with which the dictation of the subjects was altered.

Furthermore, an issue that we can avoid through interviews with teachers and contrasting with the questionnaire is the notorious pre-existence of the gap in access to digital

resources, the invisibility of the real conditions of the population, and the vertiginous decisions of the levels central governments, combined with the heterogeneity of resolutions at the institutional level and at the school group level, show aspects of deepening technological and therefore educational inequality. From the interpretation of the teacher's responses, we were allowed to collect the information and contrast the inequality that appears in teaching learning processes. As we can see, the teacher has contributed to respond to the challenges that the confinement measure implies from her perspectives and personal experiences. In addition, the key is the answers; it allows us to infer that teacher are making a extensive effort because they have the responsibility and commitment to continue supporting education. In this framework, an opportunity that opens for students is to begin to see what works and what does not, in relation to technology and what things they can continue to sustain when they return to the classroom and face-to-face. It is underlined, in the foreground, both by the sections of interviews with the teachers and the data obtained in the survey, in both cases there is a worsening in inequalities during the pandemic, a situation that was not new and is subscribed to freedom and socioeconomic status of families when choosing what kind of education, they want for students.

Conclusions

During the pandemic it was thought that technology could be consolidated as the engine for well-being, but this is clearly reflected in the fact that inequalities are not reducing but could even be increasing, and although its short-term benefits are undeniable, more information on a global scale, there is a difficulty of access available. A slightly more encouraging perspective implies that despite facing great inequality, it is necessary to focus on the fact that education is the only levelling tool, through a more inclusive and resilient educational system, suitable for the future. Furthermore, we can think that the educational system through the government has the challenge of minimizing the negative impact that the pandemic has on learning and education and of applying more effective measures that guarantee access to digital education.

In this case study has allowed us to obtain holistic information, though necessarily fragmented and incomplete, about the forces that mediate the educational use of ICT in schools during the pandemic. In particular, we have made it possible to elucidate the impact of policies on the use of ICT and other political initiatives paying special attention to: organizational issues related to time and the reality of each student; the role of students and the place of ICT, the conditions of access to technology.

One of the findings is the Covid-19 visualized in the current context in matters of Argentine education the undeniable gap that exists between public and private education, with the unequal effects that are being generated, where those students who come in precarious homes (with the absence of reading material, a desk, books, Internet connection, lack of electronic device, phones, tablets, etc.) and who also feel the blows of the current crisis. This is how the technological gap has become more evident, making it clear that long-term public policies are required, which train teachers in technology but also provide the necessary resources for the development of students in pedagogical continuity in all levels public and private.

Other finding was based on what was provided by the teachers through the interviews and the strategies used by the educators, interaction with the students was made possible by the short-term effort seeking curricular compliance framed in a low pedagogical quality, given the technological deficiency both connectivity as well as devices manifested in digital and technological inequalities that have historically been present and that became even more visible with the pandemic. It was also possible to avoid that both teachers and students were not prepared by multiple factors to enter education mediated by virtual platforms and applications. This showed that computers are needed to study, technological floors, training, and connectivity for students from the periphery. In addition to these problems, we can see that high school students impacted them due to the economic crisis and many dropped out because they needed to have an income. The lack of devices at home to connect to the Internet or digital knowledge, the lack of stable economic income, the lack of access to information and a poor education tend to increase the inequalities between students in public and private schools and with which the social, economic and technological exclusion.

Through this limited study, it can be inferred that educational policies are often not adapted to the needs of students and teachers and do not have a long-term perspective. In addition, Argentina and extrapolating the largest number of countries in the region, which have implemented programs that involve the ICTs that involve the delivery of netbooks to students, accompanied by some technological training as a complement to teaching. The foregoing shows us that the pandemic has shaken the entire educational system, leaving aside the discussions in the educational authorities due to the complex educational reality, since these programs could not cover the deficiencies that the system presents in the long term. Likewise, both from the perspective of the teacher and the students, we could see

inequalities, which already existed before the pandemic, but which became more evident in a pandemic context.

Finally, in relation to future work, we will try to analyse and study different virtual environments of university and secondary education and the impact of its use in the development of digital skills, and the set of skills to transform information into knowledge, in relation to the impact of technological inequalities, and their correlation between those who have only WhatsApp as a tool to access to technology and the possibilities and access to learning, and the impact on digital citizenship. We will also seek to analyze group and cross-sectional work between students and teachers with age groups from other populations such as the university.

Contribución de los autores

La firmante es la única autora del manuscrito

Financiación

No se ha recibido financiación para este trabajo.

Agradecimientos

No manifiesta

Conflicto de intereses

La autora no expresa ningún conflicto de intereses.

Referencias bibliográficas

- ÁLVAREZ, M., GARDYN, N., IARDELEVSKY, A., & REBELLO, G. (2020). Segregación Educativa en Tiempos de Pandemia: Balance de las Acciones Iniciales durante el Aislamiento Social por el Covid-19 en Argentina. *Revista Internacional De Educación Para La Justicia Social*, 9(3), 25–43. <https://doi.org/10.15366/riejs2020.9.3.002>
- BARBERÁ, E. (2003). Profesores para la era de la información. ¿Cuál es el perfil? *Pensamiento Educativo, Revista De Investigación Latinoamericana (PEL)*, 32(1), 190-203. <http://redae.uc.cl/index.php/pel/article/view/26519>

- BANCO MUNDIAL (2020). LAC Equity Lab: Desigualdad. <https://www.bancomundial.org/es/topic/poverty/lac-equity-lab1/income-inequality>
- CARDINI, A., & SANCHEZ, B. (21 DE ABRIL DE 2020) ¿Qué sabemos de los docentes en Argentina? Datos nuevos, desafíos que persisten. https://www.cippec.org/wp-content/uploads/2018/03/caracteristicas_y_voces_de_los_docentes_web_a4_simple.pdf
- EXPÓSITO, C. D., & MARSOLLIER, R. G. (2020). Virtualidad y educación en tiempos de COVID-19. Un estudio empírico en Argentina. *Educación Y Humanismo*, 22(39). <https://doi.org/10.17081/eduhum.22.39.4214>
- FERNÁNDEZ CARBALLO, R. (2001). La entrevista en la Investigación cualitativa. *Revista Pensamiento Actual*, 2(3), 14-21. <https://doi.org/10.15517/pa.v2i3>
- FORMICHELLA, M., & KRÜGER, N. (2020) Pandemia y brechas educativas: reflexiones desde la Economía de la Educación. Instituto de Investigaciones económicas y sociales del sur.
- GRIMSON, A., & TENTI FANFANI, E. (2014). *Mitomanías de la educación argentina. Crítica de las frases hechas, las medias verdades y las soluciones mágicas*. Siglo XXI.
- LUGO, M. T., ITHURBURU, V. S., SONSINO, A., & LOIACONO, F. (2020). Políticas digitales en educación en tiempos de Pandemia: desigualdades y oportunidades para América Latina. *EduTec. Revista Electrónica De Tecnología Educativa*, 73, 23-36. <https://doi.org/10.21556/edutec.2020.73.1719>
- MINISTERIO DE EDUCACIÓN DE LA NACIÓN (MARZO 15, 2020). *Resolución 108/2020*. Boletín Oficial de la República Argentina. <https://www.boletinoficial.gob.ar/detalleAviso/primera/226752/20200316>
- MAXWELL, J. & LOOMIS, D. (2003). Mixed Method Design: An Alternative Approach. En Abbas Tashakkori & Charles Teddlie (ed.). *Handbook of Mixed Methods in Social and Behavioral Research* (pp. 241- 272). London, Thousand Oaks: Sage
- MINISTERIO DE EDUCACIÓN Y UNICEF (2020). *Informe Preliminar Encuesta a Hogares Continuidad pedagógica en el marco del aislamiento por COVID-19*. https://www.argentina.gob.ar/sites/default/files/informepreliminar_hogares.pdf

- MONSERRAT, S. (2017) *Desigualdad de oportunidades educativas en Argentina* [Tesis de Doctorado, Universidad Nacional de La Plata].
http://sedici.unlp.edu.ar/bitstream/handle/10915/59869/Documento_completo.SERIO_vfinal.pdf-pdf.pdf?sequence=4&isallowed=y/
- OBSERVATORIO ARGENTINOS POR LA EDUCACIÓN (2019). *El estado de la educación en la Argentina. INFORME ANUAL*.
https://cms.argentinosporlaeducacion.org/media/reports/El_estado_de_la_educacion_Argentina.pdf
- OBSERVATORIO ARGENTINOS POR LA EDUCACIÓN (2020A). *¿Cuántos estudiantes tienen acceso a Internet en su hogar en Argentina?*
https://cms.argentinosporlaeducacion.org/media/reports/ArgxEdu_Conectividad_Coronavirus_.pdf
- OBSERVATORIO ARGENTINOS POR LA EDUCACIÓN (2020B). *La educación argentina durante la pandemia de COVID-19 Un estudio sobre la situación de familias y alumnos durante el aislamiento. QUINTO INFORME Análisis comparado entre educación pública y educación privada en contexto de COVID-19 (primera parte)*.
https://cms.argentinosporlaeducacion.org/media/reports/Analisis_comparado_entre_educacion_publica_y_educacion_privada_en_contexto_de_COVID-19.pdf
- OBSERVATORIO DE LA DEUDA SOCIAL ARGENTINA (2020). *Desigualdades sociales en tiempos de pandemia*.
http://wadmin.uca.edu.ar/public/ckeditor/Observatorio%20Deuda%20Social/Documentos/2020/OBSERVATORIO-COMUNICADO-ODSA%20INFORMA-%202-31_03_VF.pdf
- PRETI, M., & FERNÁNDEZ, M. (2020) *Educación y desigualdade socioeconómica. Políticas públicas em tempos de pandemia (República Argentina)*. *Rev. Caminhos da Educação: diálogos, culturas e diversidades, Teresina, (2), 1, 22-42*.
<https://doi.org/10.26694/caedu.v3i1.11242>
- SERRANO, R. (2009). *Cuéntame tu experiencia en el curso on line. Empleo de la entrevista cualitativa como técnica para la investigación cualitativa*. *Quaderns digitals: Revista de Nuevas Tecnologías y Sociedad, 59,1-17*. <https://bit.ly/2NBonqP>

RENABAP (2018). *Argentina - Relevamiento Nacional De Barrios Populares 2018*.
<https://www.argentina.gob.ar/barriospopulares>

TUÑÓN, I., & HALPERIN, V. (2010). Desigualdad social y percepción de la calidad en la oferta educativa en la Argentina urbana. *Revista Electrónica de Investigación Educativa*, 12(2) http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1607-40412010000200005&lng=es&tlng=es

UNESCO (2005) *Hacia las sociedades del conocimiento*. Informe Mundial. Editorial Unesco,
http://www.lacult.unesco.org/docc/2005_hacia_las_soc_conocimiento.pdf

VASILACHIS DE GIALDINO, I. (2006). *La investigación cualitativa*. Gedisa.