



Educational digital inclusion. Assistance cluster for the poorest

Inclusión digital educativa. Clúster de asistencia para los más pobres

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ORIGINAL ARTICLE

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The changes of the human capital that students of *telesecundaria* education in an indigenous municipality cataloged as in extreme poverty are analyzed. These changes were motivated by the implementation of an educational digital inclusion project operated by a group of Non-Governmental Organizations, which are called the "assistance cluster". An ethnographic methodology is developing in the municipality of Coatecas Altas that is located in the Mexican state of Oaxaca, performing fieldwork for 16 months between 2017-2018 with a sample of 24 students. The findings show a favorable impact on future school perception, caused by the knowledge acquired through the school digital inclusion project, it should be noted that at least 19 students prefer to continue studying attrition or child labor, reinforced interest in continuing their studies in subsequent stages such as high school or higher level. An evident increase in human capital is concluded, the positive changes in the future perceptions of the students, in addition to the fact that the work of the Non-Governmental Organizations is of utmost importance given the inability of the State to implement educational projects in this type of context.

PALABRAS CLAVE

Educación, inclusión digital, indígena, pobreza.

Se analizan los cambios de capital humano que los estudiantes de educación *telesecundaria* en un municipio indígena catalogados como en extrema pobreza. Estos cambios fueron motivados por la implementación de un proyecto educativo de inclusión digital operado por un grupo de Organizaciones No Gubernamentales, que se llama el "grupo de asistencia". Se está desarrollando una metodología etnográfica en el municipio de Coatecas Altas, ubicado en el estado mexicano de Oaxaca, que realiza trabajo de campo durante 16 meses entre 2017-2018 con una muestra de 24 estudiantes. Los resultados muestran un impacto favorable en la percepción de la escuela en el futuro, debido al conocimiento adquirido a través del proyecto de inclusión digital de la escuela. Cabe señalar que al menos 19 estudiantes prefieren continuar estudiando el desgaste o el trabajo infantil, reforzado el interés en continuar sus estudios en etapas posteriores. tales como la escuela secundaria o nivel superior. Se concluye un aumento evidente en el capital humano, los cambios positivos en las percepciones futuras de los estudiantes, además del hecho de que el trabajo de las organizaciones no gubernamentales es de suma importancia dada la incapacidad del Estado para implementar proyectos educativos en este tipo de contexto

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1. INTRODUCTION

The empirical evidence obtained for this work has suggested that educational digital inclusion, such as hardware knowledge, computer assembly, software use and internet management, can provoke in students (Indigenous adolescent women and men who had never before related to this knowledge), an increase in human capital in the short term, leading to significant changes in their perception to face their immediate school future, since the appropriation of ICTs has a double effect. First, avoid adhering to new disadvantages, by not adding digital poverty to the inequalities that these subjects already presented, in second term, the possibility of initiating a transition to the information and knowledge society, that is to say, their future perception is modified compared to other options such as school dropout or child labor.

A school ethnography is carried out deepening in a mixed group of 24 high school students (15 women and 9 men) from the indigenous municipality of Coatecas Altas, which is located in the southwest region of Mexico in the state of Oaxaca.

The investigation had the following objectives: 1) Understand the perception of the school future of the students before, during and after the educational digital inclusion project developed by a group of Non-Governmental Organizations ONG, 2) Analyze the changes in the human capital of the students once the educational digital inclusion project was nearing completion.

The two analytical categories according to the previous areas were the positive impacts derived from educational digital inclusion and, the changes in the perception about the future of each student.

The motivation that awakens this issue is due to the fact that despite the growing interest that Information Technology and ICT Communications have in everyday life, there are still few studies that have analyzed the relationship between ICTs and the potential effects on poverty (Cecchini, 2005; Finkelievich, *et all*, 2004), especially, research is required on how ICT shape future perceptions regarding the education of indigenous children and adolescents (Becerra, 2012) (Guerra & Miranda, 2010; Quero & Ruiz, 2001) the above may be important in human groups with severe historical inequalities, where selflessness and dropout caused by child labor greatly affects the formation of human capital (Robles, 2004), since poverty is closely linked to low schooling and future job insecurity.

While studies on poverty point to its multicausal roots, in the present century, ICTs have given renewed hope on how to try to address social delays. This is ratified by the United Nations Organization, which in its development goals for the Millennium, recognizes the importance of ICT to achieve a better world, enhancing the well-being of peoples, communities and families, improving their quality of life, proving to be an effective tool to eradicate hunger and extreme



poverty, establish universal education, promote gender equality and empower women, reduce child mortality and collectively increase human capital; In addition, The UN Sustainable Development Goals that have a direct relationship between poverty and technologies, the guarantee of access to economic, educational, basic, property, right to land and property, as well as financial services, is emphasized as an objective to be fulfilled by 2030 (ONU, 2016).

It should be remembered that deep-seated delays are a major challenge, while ICTs provide multiple opportunities for children in developed countries such as Japan or the United States, the distance between them and their counterparts in poor countries could be growing, since they add to the already structural disadvantages, other new ones given by the SIC. The benefits derived from ICT are multifaceted and differ by region, while the United States, Japan and Western Europe enjoy the best income / benefit derivatives derived from the digital economy; other regions such as Africa and Latin America remain relatively relegated. The same happens within these regions with severe differences with respect to cities compared to rural regions.

In that sense, ICTs they have plunged poor rural groups into new inequalities along with traditional, since they now become since they now become more vulnerable by lacking technological connectivity and acquire new classifications and concepts such as: digital poverty, info-poor, digital divide, digital illiterates, etc.; which are combined with the exclusion of fundamental rights such as: education, health, employment, security and human rights, further radicalizing exclusion and widening the welfare gaps between included and excluded.

In the case of Mexico, the National Survey on Availability and Use of Information Technologies in Households (INEGI, 2018) revealed that in Mexico there are 71.3 million internet users, equivalent to 17.4 million homes with connectivity to this service. The age with the highest proportion of this service is 18 to 34 years old, what leaves teenagers in high school and even in high school somewhat relegated.

On the other hand, there is a marked difference by population, since of the total number of users in the country that have internet access, urban areas have 86%, while rural populations have 14%. In comparison with federative entities, the state of Oaxaca is placed in third place with less connection to cell phone with 60.8%, only surpassed by Chiapas with 58.1% and Guerrero with 59.8% (INEGI, 2019). Likewise, according to the Mexican Institute of Competitiveness Oaxaca occupies the last place in the country's competitiveness (IMCO, 2010). Its failures are grouped into several indicators such as educational quality, schooling, illiteracy, low computer penetration and low percentage of people with higher education (Chávez & Sánchez, 2013; 157).

Actions or projects aimed at digital educational inclusion in poor indigenous societies can have a significant impact if we understand the opportunity to intervene through education, because



in Oaxaca poverty is directly related to education since the municipalities in higher poverty are those where the average schooling tends to be lower, in addition there is another correlation because the incidence of poverty is present especially in indigenous municipalities, where the schooling of people aged 15 years or older was 7.5 years, which in Mexico it is equivalent to a year and a half of secondary education, as well, only 33.1% of *telesecundaria* schools in indigenous regions have at least one computer that places this entity below the national average with 36.8% (State educational program of the indigenous population Oaxaca, 2018) under this condition the students who attend this type of school are limited access and transit to the SIC.

ICT could approach the less poor in an immediate way giving way to more direct positive impacts. On the other hand, the poorest will have severe difficulties in investing in ICT capital derived from low productivity, unemployment and market imperfections along with low infrastructure. Therefore, the relative cost of access to ICTs is high for the poor, while for the rich it is low; however, there is already enough evidence in the world that allows us to affirm that ICTs in case of reaching the poorest can cause important transformations by improving their quality of life and even creating changes in the investment of human capital, above all, by implementing projects of education and training in developing countries (Cecchini, 2005).

If it is possible to overcome the digital divide, ICTs could cause multiple positive effects in the hands of the poorest, since, as Lishan Adam (2005) explains: a) the potential of ICTs would become more significant, since it would decisively involve those who most need information and knowledge, b) could warn of innovative approaches to supply everything that cannot be economically solved and, c) therefore, alternatives "appropriate to the contexts" would be generated that would reduce the excessive expense of transporting technologies and applications from developed countries or regions to poor contexts. For this author, the approach of the poor in ICTs can avoid failures derived from social and cultural ignorance of social and cultural organization, in addition to evidencing other financing alternatives for advanced technologies using more traditional technologies such as radio or television, as well same, to emphasize a flow of information and non-hierarchical and contextual knowledge of the poor. "In this way, intermediation, contextual rescue and empowerment information become more relevant to the poor than mere advancement in new technologies" (Adam, 2005; 1).

According to UNESCO, ICT can contribute to building human capital in the face of the inevitable transformation of traditional forms of teaching and learning, since it is not only a form of communication, but it involves new forms of narratives and identities of an aesthetic and relational nature, constituting other types of subjects with differentiated citizenships (UNESCO, 2013). Therefore, the commitment to an educational digital inclusion can be presented as a highly



viable option in the face of the failed effort of educational policies that faced poverty as the main wall when seeking to improve the future human capital of the poor.

It is then that, the educational digital inclusion would allow developing a group of strategies to provide computer and digital resources towards subjects that have traditionally been apart from them, causing a positive integration of ICT in education processes.

Educational digital inclusion is understood as the systemic approach and training on ICT, which fosters other forms of opportunities, skills and knowledge for young children and adults, around specific curricular content. With this, institutional and pedagogical resources are revalued seeking an inclusive social impact, creating transformations in the teaching-learning processes in the future (Federal Education Council, 2010; Lago, 2015).

For Cabero & Córdoba (2009) there are three measures to provoke an educational digital inclusion: in the first sense, there should be a direct access to ICTs, subsequently, a use and appropriation of technology given by adaptability, accessibility, and usability, while thirdly, to develop digital literacy processes to incorporate the greatest amount of codes in the technological world into everyday use, in this way, digital exclusion will be prevented from becoming more social exclusion. Therefore, ICT could be strategic allies to achieve educational inclusion because the use of technology in the hands of students can lead to training processes at any time and place (Balladares, 2019).

The education is a process that seeks to affect the present and future of those who receive it. In this sense, in this sense, the theory of human capital tells us that investment in education, health and social welfare can be the desired formula to at least eradicate poverty in a real way (ILO, 2013) (STPS, 2014). This theory considers formal education together with job training as the most important elements of development (Robles, 2004). In this way, children and adolescents who have managed to increase their human capital could improve their future income, being proportional to the number of hours invested in training, although it can be said that this is not an automatic relationship, since there must be a correct opening of economic policies, fostering an investment and development of skills, opting for adequate environments to redeit those capitals (Villalobos & Pedroza, 2009). Therefore, education is a durable consumer good that will have its effects within a specialized market.

The theory of human capital from its origins to the present day remains an influential conceptual vision in the framework of globalization, because it conceives education as an investment that will generate utility in the future and that favors economic growth in various ways: job qualification, technical production, research, physical mobilization and functional mobility optimization (Villalobos & Pedroza, 2009: 279).



The World Bank defines human capital as the values and learning of people throughout life, it is the most important component of wealth worldwide, it can be used to estimate the future value of labor forces based on the Human capital present (Lange, Wodon & Carey, 2018). Walsh (1935) document from before the first half of the 20th century that the investment parents make in the education and training of their children results in future optimal income opportunities. In the previous sense, for Schultz (1985), education can be understood as a synonym for investment, as well as health, they represent determining factors to consider better future income. The claim of this author is that education (training) provides a better quality of life.

Human capital is an individualistic theory of the job offer (Tohaira, 1983). This is also a theory of poverty, since it suggests that the poor are because they have not been able to make a greater investment in their training, “then income poverty is explained by lower productivity, and this by a low investment in human capital”(Dallorso, 2013, 121). Becker (1965, 1993), on the other hand, made a huge contribution to the human capital model, analyzed the costs of education or training, as well as the time devoted to these with respect to the expected profitability. His studies on the evolution of time explain why investment at an early age is fundamental with respect to ages already very advanced, since the time of production of human capital is less as well as the recovery time. His analysis of time shows that the way in which this new human capital is forged is to invest time for its production, in addition to buying necessary goods for this purpose, therefore, the more time invested in forming human capital, the greater the future income (Becker, 1993; Becker; Falgueras, 2008).

So, ICTs outline the hope that several technologies can reverse the harmful effects of the entrenched poor in relation to low education and low investment in human capital, as governments and subjects cannot achieve more encouraging expectations in the fight against inequality in earlier times; according to the Organization for Economic Cooperation and Development OECD in a very short time all aspects of human life can be regulated by technological instruments, resulting in a source of transformation that will determine the new profiles of future generations, in this way, the Children, adolescents and young people see new approaches to instruction, training, education and social relations regulated through a technological interface that could cause beneficial changes with respect to their predecessors. According to Kaztman (2010) “for the sectors of lower resources resulting increasingly clear that the lack of access to the digital world excluded from the main circuits of the economy, politics, society and culture, and that the resulting isolation it plays against its resilience towards social disaffiliation”.

An important mention is the educational system on the debate of digital inclusion, since educational institutions can cause digital inclusion even in spite of having all the disadvantages of



residence and income, in this way, schools have the obligation and power to cause a change despite the socioeconomic condition that surrounds them, in this sense, for Kaztman “the educational system is the main (if not the only) state institution, with the ability to dissociate social origins of achievements in those domains of the ICT that increase the opportunities for full participation in the main circuits of society” (Kaztman, 2010; 6) for this author, the impacts of educational digital inclusion are in several areas at the same time, as it is a modernization that it infects the environment where schools are located in poor areas, but in addition, there is a transformation in the subjects increasing their receptivity by bringing new forms of dialogue with teachers and the world around them; The ability to communicate through their particular interests and live with a wide range of similar content, therefore, reducing the gap and digital poverty brings personal and collective transformation.

Regarding the context and characterization of the study, this was carried out in the municipality of Coatecas Altas that is attached to the Zapotec indigenous ethnic group in Oaxaca. It has a total population of 4,712 inhabitants; 37% of the population is under fifteen. (SEDESOL, 2013). The municipality has a very high degree of marginalization and a very high level of municipal lag. It is considered a Priority Attention Zone (ZAP), representing that multiple social programs can operate. These include SEDESOL's public programs such as “Progresas” (formerly Prospera-Oportunidades), “65 and more”, “Mexico without hunger”, “community canteens”, “Rural supply DICONSA”, and “Attention to agricultural day laborers”.

Numerous press releases and the work of civil associations realize that in this municipality migration has been established as the main economic strategy of most families. In addition, there has been a tradition of child labor since 1960 as farm laborers to other states of the Mexican geography. Migration to northern Mexico is seasonal with periods of three months outside its community (February-April, June-August and October-December).

In Coatecas Altas there are 10 preschoolers with an enrollment of 171 students (Ministry of Public Education, 2010). Federal elementary school since the 1960s, but until 2010 began the *Telesecundaria* School, while in 2015 the intercultural baccalaureate. 88.7% of children aged 6 to 14 attend school (95.2% is the national average) (SEDESOL, 2013). By 2010, 16.1% of girls and 12.2% of boys aged 8 to 14 could not read and write (INEGI, 2010).

Finally, in the municipality there are 925 homes, of which 0.34% have a computer, 14.7% have a landline, 7.1% have a cell phone and 0.1% have an internet connection (INEGI, 2015). It should be noted that there is no cell phone signal in this population and fixed telephony is through the TELMEX company network.



2. METHOD AND MATERIALS

An investigation was conducted from the qualitative approach in a *telesecundaria* school of the municipality of Coatecas Altas in Oaxaca Mexico, in principle the educational programs and educational plans available to the school curriculum were sought to understand the existence of efforts related to digital education. Subsequently, ethnographic field work was carried out for 16 months between 2017-2018 with a group of 24 first and second grade teenagers, whose ages were between 11 and 14 years, this group was constituted for the purpose of receiving training in digital education at the request of a group of NGOs that implemented a training project proposal.

Twenty-eight in-depth interviews were carried out with the students, in four cases two interviews were conducted with each student to deepen in detail about the knowledge that they had acquired with the course, 15 women and nine men participated. In addition, three interviews were applied to teachers of the *Telesecundaria* School, and another three were with teachers of digital education courses belonging to NGOs.

The teachers of the *Telesecundaria* School based on the interest of the students, as well as in the grade point average, because it was considered that this digital education course should be a prize for those who performed well, determined the selection criteria of the group.

The analysis was based on two categories with which to compare the data of ethnographic work:

- 1) the positive impacts derived from educational digital inclusion, especially in human capital and,
- 2) Changes in the perception about the future of each student or student.

With respect to the first category, the impacts would be valued positive if the students considered that they could be of practical utility, improvement of knowledge or could serve to perform some type of action in the present or future. In this sense, the students answered questions from the semi-structured interview where they valued the degree of usefulness of the knowledge and its possible application.

In the second category, again, the students assumed an evaluation of how much and how digital education had changed their perception of their continuity in the following school grades and their aspirations about the future school and / or professional in their case. It was deepened through semi-structured interviews in understanding what they do with this new knowledge in digital issues and what they want to do according to their own interests.

3. RESULTS

Taking into account the two types of analytical categories, the findings suggest three fundamental aspects:



1) Training in digital education modified in 19 students (12 women and 7 men) their perception of child labor over permanence in school, that is, in a society where child labor is traditional as a family survival strategy, this type of projects could help to include new time weighting logics and the activities that adolescents do. On the other hand, 5 students (3 women and 2 men) stressed that, despite receiving digital training, they would prefer to remain in child labor because it was a necessary activity for the lives of their families and preferring to obtain income more immediately. This shows us the importance of both formal and non-formal education to reduce child labor in societies with high roots, because with the increase in knowledge, children, adolescents and young people see their expectations changed, being common to experience another type of desires even in spite of their social realities (Cecchini, 2005; Katzman, 2010; ILO, 2006) in this way, it is worth noting that digital education could generate an increase in capacities which would cause an impact on the perception of child labor, avoiding new concatenations towards other types of social exclusion (Cabero and Córdoba, 2009; Balladares, 2019).

2) In all 24 students, they valued the digital education project in a positive way, being directed in four lines that the students highlighted: a) learn a hardware assemble, since this training will allow you to do something that before the project they thought was impossible to perform b) the use of free software means a tool that, if required, can be used as an aid for future work. c) the knowledge of the internet and their personal interests has allowed them to have another vision of the context where they live and another vision of the world in general and, d) the total set of digital training because they know that other places in the world this knowledge is common, highlighting that before they were relegated from it. This knowledge and skills that students possess can mean a substantial improvement in their human capital. In this sense, it was observed what some authors have already pointed out (Becerra, 2012; Guerra & Miranda, 2010) because ICTs in the hands of indigenous subjects can be reappropriated according to their present and future expectations, especially in their education resulting in new perceptions of face your development.

As Adam (2005) points out, the transformative character of ICT in the poorest can be a positive irruption appropriate to their contexts and needs. The way in which these adolescents were socialized with digital education, not only allowed them to have knowledge, but that it will be useful or cause changes, in this way, the 19 students of the first finding will consider continuing their studies to conclude their secondary education, aspirations to pursue the upper secondary level or high school, there are even 12 cases where the students have been so motivated that they would like to study a higher or university technical training.

The gender analysis shows that there are no substantial differences with respect to the three findings and that it is personal and / or family issues that may suggest that students prefer other



activities such as child labor or school dropout to continuity of studies, but in any case, this aspect escapes the interests of this study.

4. DISCUSSION

Coatecas Altas is a municipality to which a large number of social programs and public resources enter to meet a series of needs as a municipality listed in extreme poverty but their condition of digital connectivity is very poor, and this is mainly due to the fact that both governments and private companies have not been interested in implementing digital projects in the region, however, their isolation has caused the interest of civil society entities seeking to undertake ideas and actions to mitigate social exclusion where federal programs fail to act, seeking a broader impact on those most in need of help (Finquelievich, *et al*, 2004). In this way, the empirical evidence suggests that it has been the sum of efforts between various factors such as public educational institutions, municipal governments, associations or civil society groups and socio-community organizations such as the committee of parents, which together have managed to develop a digital inclusion project in the *Telesecundaria* School. In this way, there is a type of “assistance cluster” that tries to add efforts of various agents to attack a series of social disadvantages that have their origin in inequality and poverty.

Authors such as Neale (2017) and Gordon & McCann (2000) have analyzed the importance of clustered networks or clusters to counteract disadvantages, being joint efforts to empower individuals causing the increase of social capital that would mean direct actions towards development. In this way, previously excluded populations or subjects can see their opportunity patterns modified because of the strategic action of inclusion and capacity building as human capital (Lee, Lee & Pennings, 2001).

The antecedent of this project is given with the arrival of the Save the Children Foundation, which since 2009 has implemented in the municipality electrification projects, drinking water, agroecological techniques, disclosure of children's rights, and in recent years, it has convened other non-governmental entities with the objective of improving the human capital of children and adolescents.

Through Save the Children, the arrival of the Jacarandas Foundation takes place (along with the Jacarandas Foundation, the Bonanza Foundation, Cántaro Azul Foundation, Walt-Mart Foundation, among others) have also arrived, operating with Mexican, British and Mexican personnel. American, since through the United States Embassy in Mexico has managed to channel economic resources to develop projects. In this case, they arrived at the Coatecas Altas *Telesecundaria* School to implement an English training project for students, that foundation



created a civil society in Mexico named Jacarandas Education in 2006, which operates a project called “Education for the XXI century

In the words of the director of the *telesecundaria*, supports come in groups through several NGOs, because in this way, the resources are maximized and the impact is greater, therefore, the same universe of beneficiaries can see impacts in the short term through various programs: English language training, computer assembly, use of ICT and web browsing, as well as other courses such as agroecological systems management, intercultural communication and human rights. Therefore, through these clusters the benefits can be multidimensional, because it is not only about the strict sense of training adolescents with knowledge in digital matters, it also fosters another way of relating between students, changes between teachers and other agents of their communities, which encompasses impacts beyond the strictly curricular, which in the words of Kaztman (2010) could be said to restore social affiliation processes.

Through the actions undertaken by this group of NGOs, a budget was administered with the municipal government to pay for the satellite internet service; an Oaxacan microenterprise is hired to provide this service in rural settings, where large companies have no interest.

In a first stage, the Jacarandas Foundation trained a group of 28 students with English language courses for a year, these students were in the third grade of secondary school, the members of the associations saw the need to expand their offer and that could reach more students, as well as the instruction of new knowledge for the future, for this reason for the second generation of the English course, 40 students were trained and of these later 24 students would pass to the course of computation and use of the web (digital education), in addition these 24 selected students would participate in a course of assembly or assembly of their computers, use of free software and maintenance of computers.

With the sum of efforts between various entities, it has been possible to equip a computer classroom for the benefit of all current students and future students; in addition, the pattern of human capital was being modified through new resources and investments in the training of subjects with a different profile. In the voice of teachers, students have become very active and participatory, which is a very remarkable work, because schooling in contexts of extreme poverty must fight against multiple inequities that in many cases causes school dropout:

Of course there are changes and they are obvious, the students really wanted to know the English language, they are attractive, the same happens with the world of digital technologies, because they have heard about them, since some see it on television or it simply call them a lot of attention, they are attractive, the same happens with the world of digital technologies, because they have heard about them, since some see it on television or simply

call them a lot of attention, especially since they now have the possibility not only to satisfy their doubts, but to enter the world of digital from an orderly and with accompaniment, it is a training experience that can undoubtedly serve them for the future (37-year-old male teacher interviews, May 2017).

The computer assembly training brought a renewal to the understanding of technology for these students, since there was a prejudice of being something extremely complex outside the adolescent understanding, however, the immersion projected by the teachers of the Jacarandas Foundation led to Students were socialized in a friendly way with the functioning of the teams:

They taught us how the internet works from what the meaning of the WWW (World Wide Web) was, the parts of a computer and they told us how to build one, they asked us for things from our houses that could serve as a case or hardware for the parts of the equipment, I carried a plastic tray and there we put part of the CPU, each of us brought objects to assemble their equipment, they explained that we should not be afraid of devices that were the same as an iron or a radio, you just have to know them and with practice we could build a computer ... it was interesting because I never thought it would work and we could do it ... now I want to know more about all this (Rosario, 13, interview 2017).

The digital inclusion project marks the beginning of a gradual change between the generations of teenagers, since it is not only about the knowledge they are developing, but also the interrelation processes that can cause when accessing the digital world, in the words of Genaro, an 11-year-old boy, the internet changed his mind because unlike television, each person decides what he focuses on: “When the teacher tells us, what would we like to know? I wrote on the computer Villa Juárez in Sonora, because my dad works there and I liked to understand how things are there, I recognized by photos places where I was when I went there, it's like going where you want from here” (Genaro 11 years, interview 2017).

When they selected me to build a computer, I liked the idea because I was going to do it for myself, they told us how to do it and they helped us, to put the pieces together, I had never put together such a thing in my life, before I thought that a computer is something that is bought and that is very expensive and delicate, but when we use them in school as they are transparent we see how they are made inside and how they work ... If I would like to learn more (María, 12, interview 2017-2018).

The “assistance cluster” focused on a series of aspects that were concerning societies in inequality and poverty, in this case digital education chose to try to have a positive impact on the lives of these 24 students, since it is an environment with high Child Labor Migration The adolescents responded in an optimal way when taking all the training, the interview data show us

an increase in human capital by having greater technical skills and understanding a series of instrumentalizations and codes typical of the computational field.

The acquired skills prevented greater social exclusion, not only of an educational type with respect to other regions of Mexico where training in digital education is given, but also by encouraging technological appropriation, assuming that this project caused the daily incorporation of students into 24 students. ICT in their school activities, but in addition, it derived in multiple personal interests, in this way, the training processes went beyond their initial objective as they were not limited only to the times or school spaces coinciding with other types of research (Cabero & Córdoba, 2009; Balladares 2019).

I learned to build a computer, then to surf the internet, also to use programs and search for information, in addition to Basic English vocabulary. I feel happy because I did not know anything about that before and now, I am smarter... I would like to continue in school after telesecundaria, everything that can be done through a computer caught my attention, I would like to be an agronomist or something like that because I asked and I liked that (Joaquina, 14, interview 2018).

I no longer liked working, now I want to study, I think I can help my family more if I study because I have learned a lot with the internet, I realized that it can help for many things and from one place, I even think you can study through the internet and I want to do that ... I thank the teachers because they have made us think differently, they come here to help us and it is for our benefit, for our future (Francisco, 13, interview 2017)

It should be stressed that the subjects of the research were indigenous adolescents and the objectives proposed by the educational programs were consistent with this age. In general, this project was considered successful both for the assessment of teachers and trainers, as well as the opinion of the students, the way in which these indigenous adolescents have joined the project coincides with the findings of other authors in the case of other indigenous groups in basic education, speaking of “a local cultural approach” (Guerra & Miranda, 2010), because students understand technological globalization through their needs, their social and cultural contexts, in this way, there is a concern to learn more and to change the reality that they conceived as unique. It should be said that this digital education should be maintained in the new cycles and educational processes of these students, in this sense, strategies should be created to increase training towards new horizons of digital type, and this is where there can be a distance, as the middle school The superior of this municipality does not have a project of this type, it is here where part of the road already advanced can go back. Becerra (2012) points out those indigenous university students have severe inequalities because cultural, social and educational factors in contexts define long-term



digital integral education. In the case of the 24 students of the Coatecas Altas *telesecundaria*, there is a risk of falling into a new exclusion gap if no training projects are developed, these could be medium and long-term repercussions of an educational strategy focused on a stage of life.

5. CONCLUSIONS

The empirical evidence shows us that the digital inclusion project studied is successful to some extent, since it meets the objectives proposed by the directors of the NGOs and teachers of the *telesecundaria* school, which is to provide students with skills and knowledge that can promote a friendly and efficient immersion with digital technologies, is about provoking processes that favor the interest of adolescents, so that they can lighten their transit to a digital citizenship.

The students interviewed have new knowledge in the areas of English, computer science and use of web resources, showing a change in human capital when graduating from *telesecundaria*. As Lishan Adam (2005) proposes “ICT for poverty” can cause revolutions in those who, due to their social situation, will derive in new ways of understanding their benefits, adopting them to their contexts, in this way, it is striking that access to computers in the *telesecundaria* school it was not buying them, but arming them with objects they have in their homes, causing two remarkable effects, causing two remarkable effects, a differentiated socialization and digital literacy towards their own context, and on the other hand, the creative faculty that can derive from it to the provide basic knowledge of electronic circuit assembly.

It is too early to know the result of this project in the long term, but the students who participated have modified their status as human capital and thus could improve their future condition with respect to the quality of life, with the hope that in the future find the necessary support to keep your concerns, likewise, 19 of them have modified their perception by preferring to continue studying with child labor.

On the dynamics of structural nature, much remains to be done. In the first instance, governments must improve their connectivity strategies by allocating economic resources to solve the lack of infrastructure, as well as work in a more coordinated manner with other agents such as NGOs, thus sharing similar and objective routes.

In the previous sense, the empirical data suggest that the sum of actions between different entities can reduce the educational digital divide that totally isolated the students of this *Telesecundaria*, but you must be cautious because these actions are at risk of continuity, since they are supported by the procurement of economic resources from various donor agents; therefore, the Mexican State through public policies owes a debt to these generations of teenagers who see their days pass between possible exclusion / inclusion.



Finally, There are many questions that could have this research, we will have to study how durable these new knowledge is in an environment like the one that has been developed, make diachronic analyzes to observe the medium and long term effects of the increase in human capital, make differentiation by gender, as well as other comparative studies by regions or ethnic groups, in summary, the topic provides interesting clues that will guide the studies in the coming years.

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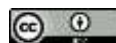
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