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## **Technology and social inequality in education in the Spanish context**

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### **Summary**

In this article, I will analyze the possibilities that new technologies present us with both to increase and to diminish existing social inequalities. I will examine the topic from a conceptual point of view taken from preexisting models of technological development and from the primary functions attributed to technological products. The educative intervention proposed in this paper is founded on the previous explanation, mainly because we understand that a wider knowledge of technology leads to a greater independence of its users from such devices so as to reach a more thorough personal and social development.

### **Keywords**

Inequality social; technology; literacy; social distancing hypothesis; gap digital; education; knowledge.

### **Introduction**

The study of inequality among human beings has ironically enjoyed a sad but very long tradition, and is one of the mayor discrepancies on the entire planet within the history of humanity. In the interest that this reality and related investigations do not come to a standstill—a possibility in moral contradiction with the intelligence, feelings and ideals of humanity as a whole—it is our duty to analyze whether the new technologies are introduced in school environments to stop and disminish social inequalities.

In the face of the information that we are obtaining through current investigations, I think that there is a double relationship between the knowledge of technology and increase of social inequality. In the first place, the inverse of the degree of participation with respect to deciding what path technological development must follow and the level of dependence on the corresponding technological products. I observe that a greater participation in the decisions taken about what tools and devices must be designed and constructed (an option which presupposes the possession of adequate knowledge to make such a decision) leads to a lesser dependence and control of those who decide about technological products. In interviews with people who live in ecological communities, we see that they

are the ones who decide what tools and devices should be built according to their own necessities and their particular way of living in nature (solar kitchen, solar refrigerator, solar coffee maker...). On the same note, they are also the ones who learn how to construct such devices with the help of specialized groups like the TIA association (Technologies and Alternative Investigations) that, in addition to permanent workshops dedicated to ecological inventions, provide information in meetings like the Second State Convention of Ecological Communities, celebrated in August of 1999 in Artosilla (Huesca, Spain). Finally, we can see that the dependence these people have on any concrete device is minimal because, in the presence of malfunction, they can repair the machine themselves. This is the case because they possess the necessary knowledge to do so for being the inventors and builders of their own technology.

After commenting on the first part of the double relationship that I have just mentioned, we now come to what I call the direct relationship. Here, I'm referring to the relationship observed between the level of independence and training of a subject and his developmental and personal possibilities. Among the information that we are collecting—in this case I'm quoting the project for audiovisual literacy conducted by a group of women from Leganés (Madrid, Spain)—we see that people who achieve literacy using audiovisual tools show a greater level of autonomy in their lives and, consequently, say that they feel more satisfied in their personal, family and social environments. Concretely, the conclusions made up to the present demonstrate that these people are more prepared to avoid manipulations. They have more tools of analysis, and they understand the world better. They consider themselves as citizens who participate more, and they have a greater level of self-esteem and security (courses 1997-1998 to 2002-2003).

As a conclusion to the previous arguments, I insist that when there is a wider knowledge of technology there exists a smaller dependency on technical products of participants. The degree of a subject's independence and personal development will situate him in unequal conditions to perceive the world and relate to all that surrounds him. In this sense, the greater or lesser control of subjects exercises a very complex influence, leaving them on unequal grounds in the utilization of technological products and in the learning of the languages and codes required. Consequently, a subject's classification in categories will be more varied and flexible, and his placement there will have a high gradient of positioning. Therefore, the possession of knowledge is a common element in both the theoretical positions of Bernstein (1990, 1993 and 1998) and Foucault (1968, 1979 and 1981). It affects technological development related to what can or cannot be done with such products and the degree of control that they can exercise over human beings. For these reasons, I believe that technological knowledge (languages, strategies of analysis...) is a basic element in the fight against social inequality as we will see in the next sections of this article, but it does enclose certain dangers. In the first place, this knowledge can be used as a kind of knowledge/power to justify the creation of rules and regulations for social life. In the second place, the possession of this knowledge by technicians promotes them to the category of experts while providing them with the power and possession of references of normality. These references indicate just how human beings must behave with regards to each one of their corresponding subjectivities, among which are those that stipulate what technological products should be used for and how they should be used.

## **Inequalities in the presence of new technologies in the Spanish context**

The existence of basic inequalities between human beings in the presence of the knowledge and utilization of new technologies is a reality and has been pointed out from distinct areas of study. For example, the report of the National Administration of Information and Telecommunications of the U.S.A. published in 1999, states that 47% of white American households have a computer, 26.7% with access to Internet whereas Black and Hispanic households only reach 23% with a computer and 8.7% with Internet access. Inequality between European nations can be seen in the results of the Eurobarometer: Europeans and the Information Society, conducted by the British consultant INRA in 1999. This study indicates that the average of European households that possess a computer is 30.8%, and those connected to Internet are 8.3%. Spain is at a lower level with 28.4% with a computer and 5.9% connected to the network respectively. A last piece of information is offered by Area (1998) with respect to the average profile of Spanish citizens that have access to Internet—male, between 20 and 44 years old, with a University degree, resident of a mayor city and from a middle or high social class. Area adds that "technological inequalities make even larger the cultural and economic separation between social groups...They improve communication between those who use them, but they exclude those who do not" (p. 4).

At the same time, the previous consideration made by Area—the increase of inequalities mediated by technology—is a motive that worries different authors because of the potential dangers that could arise in the future. Among the reasons used to justify such dangers, there are two that I consider more relevant: basic inequalities provide an unequal access to the coming digital culture (Cebrián, 1998; Kearsley, 2002), and the confirmation of the social distancing hypothesis (Muñoz Alonso, 1992; Qualter, 1994...). The first idea takes for granted that, in the near future, we will live in a universal digital culture where all of us will be equal because computerization makes no exceptions for gender or class; but such computerization makes equal only those who are connected to the network. This same argument underlies the 1999 report issued by the UNPD (United Nations Program for Development). One piece of information contained in this study is that the wealthiest 20% of the worlds population controls 93% of connections to the information network, warning that "the network has become a protective cover for those who manage to connect, but a barrier that excludes more and more those who cannot afford a connection to this information and communication source" (p. 28). Cebrián (1998) considers inequality of access a problem because the future's knowledge will undoubtedly be digital, in the same way that the circulation of information and knowledge already is.

The second argument that I mentioned—the social distancing hypothesis—is related to the previous one. On very ample terms, it proposes that when the circulation of information increases through mass communication means in a social system, the most informed population segments, or those with a higher social-economic standard, tend to select and process such information more globally than those who are less informed or with a lower social-economic standard of living. As a result, the increase of information, instead of bringing people closer together, contributes to increment the distance between bodies of knowledge and, consequently, the appearance of social-cultural breaches. It can be observed, thinking in terms of Foucault—although this time the case is slightly different—that the possession or lack of knowledge is a source of social inequalities.

In the face of these dangers, there is a certain unanimity to recommend the introduction of new technologies in education centers with the intention of training teachers and students in the technical mastery of such devices and in the development of certain abilities (information searches, selection, learning to learn...)—an aspect that I will analyze in the following section of this article. Right now, I only want to suggest that, based on the arguments that I have presented in the previous section, the incorporation of computer products (almost completely finalized in the majority of education centers), and the appropriate training in their use, must be done under certain conditions and specific positions that do not coincide with the interests that, curiously enough, the world's governments also have. Basically, the conditions that I am referring to are that the incorporation and adaptation of new technologies be carried out accompanied by the knowledge that gathers together, among other things, the history of their development, the interests and conflicts that have laid out their journey to the present, as well as all other elements which could permit users to reflect on and make use of the primary functions of all computer and communication products.

I consider it necessary to analyze the interests that different governments have in promoting the introduction of computer and communication technologies in the greatest number of households and social institutions as possible—for example the education institutions. The information upon which I base this observation is rather direct, as in the case of fiscal incentives and other savings that governments create to help in acquiring a computer system (see the declarations of the Minister of Public Works and the Minister of Economy and Taxation on the debate over *The Society of Information for All*, celebrated in Madrid on the 18th of April, 1999). Other information reflects this interest in a more indirect way, mainly because it refers to the introduction of such technology in education institutions (see for example the investment made by the Community of Madrid to introduce 2857 computers in 1000 public schools until the year 2003, as well as the investment made to install Internet connections in all public schools during the 1999-2000 academic year). I understand that this measure on behalf of governments responds to the interest that economic power structures have to achieve their goal of connecting the majority of citizens of developed and developing nations to the network so that they can participate in the global market provided more and more by Internet. This interest of governments can be clearly appreciated not only by the constant barrage of offers made by companies to favor access to new technologies, but rather by the necessity that they have to channel their commerce through the network or simply disappear as Schwartz (1999) predicts.

In the interest of becoming more familiar with the aspects that differentiate the strategies proposed by governments to introduce new technologies, directly or indirectly through education institutions, I have reviewed the functions that they give to such products, trying to respond to questions like: what are they used for?, and what do users have to do with them?

In the Spanish context, the Commission on the Market of Telecommunications (CMT), in which there is Government representation, issued a technical report on the 16th of September, 1999, where it explains that the scarce presence of computers and Internet connections in Spanish households (1.8 million at the end of 1998) is due to the difficulty that users have to use and configure their systems, and to the inappropriate price to connect to the network. The policy they propose to follow is to make the utilization easier with the design of manageable navigation software. SM publishing provides

another example. This company has created a free web page ([www.profes.net](http://www.profes.net)) to be used by secondary education teachers, which divides its content according to different areas of study (Mathematics, Geography and History, Religion...). Each one of these fixed sections contains information like a monthly magazine, a resource database with pre-prepared materials for use in the classroom and a virtual consultant to solve any teaching problems or difficulties that anyone might have. In the previous cases, a basic function of computer and multimedia technology exists which permits users to connect to Internet, whether it be to provide access to whatever product or service (a proposition of the CMT), or to offer sources of information and assessment. What type of teacher do the designers of the web page created by SM have in mind? I intuit that they are not thinking of a person given to reflections carried out through dialectical processes that include and relate relevant elements of an education center and its surroundings.

Up to this point, I only want to make a few more reflections and considerations before moving on to the next section. In the first place, computer and multimedia technologies, considered globally, are made up by a group of systems of a technological-symbolical nature (fixed image, sound, moving image, computers...). Each one is founded on a variety of products or devices with the goal to make communication easier through a concrete representation system. For example, the fixed image system is based on a traditional camera, on slide projectors... Each one of these devices has a primary function that defines its essence and other secondary functions. So, in the case of the fixed image, the primary function of a photographic camera is to create, communicate, say something...; the primary function of a projector is to reproduce previously created images. The secondary functions are multiple, for example, a slide projector can be used as a source of illumination for whatever space or as a paperweight...etc.

In this way, a technological system, considered in its entirety, has a series of associated meanings with a variety of finalities according to the nature of the primary functions of each individual system that constitutes it. For example, the fixed image system's primary functions are to create (taking into account the essential role of the photographic camera), or reproduce (referring to the basic function of the slide projector). In certain occasions, there is a function that has more predominance in a culture. Inevitably then, other functions, other meanings and other technological products of the corresponding system are either hidden or made more evident.

So that not everything is looking and listening, from my point of view, introducing all of the essential functions of a technological system means incorporating all of its products united with the knowledge (languages and other representation systems...) that make it possible for us to understand and use them. This supposes that users have more autonomy and, as a result, more possibilities to be actors that are difficult to classify, and with such a mobility between categories that they possess the ability to analyze, think about, denounce and fight against the miseries they detect.

## **What should education institutions do?**

Another question that I must specify is related to whether or not new technologies are introduced in school environments to stop and diminish social inequalities. The answer has generally been affirmative from the positions of different fields of study and authors. On the same note, this affirmative response has been justified with arguments like the social distancing hypothesis that I presented in the previous section. I believe that the introduction of technology should be carried out following a series of precautions. Also, I understand that whatever action taken with new technologies should be directed towards a redistribution of the material wealth and culture of the planet. To achieve this goal, it is necessary to increase the population's participation in the decision making about the path technological development is to take, or in the same sense, to apply Aristotle's practical rationality. In the case that this is not possible for the existing social and political systems of the majority of the so called developed nations, as appears to be the reality at the end of this millenium, we should then make general, for the entire population, the possibility of using not only the secondary functions of technological devices, but also their primary functions. To reach this finality, it is necessary to redefine, from all possible positions, the functions of predominant new technologies, and to present the meaning and essence of devices conceived to create and communicate. One of these positions is education, in which we must develop the primary functions of all technological products in the school system in order to establish practical situational uses that generate a consciousness of the state of the planet and, consequently, inspire the participants of school life to make propositions designed to transform and resolve social miseries related to such situations as hunger, injustice, etc.

Even after analyzing the previous propositions and specifications, the question—what should education institutions do?—is so extensive that it is difficult to answer, because it undertakes all kinds of solutions designed by all of the peoples of the Earth. In order to deal adequately with this topic, I would have to reconsider ideas like the pardoning of the third world's external debt in the hope that this does not become an "eternal debt" (Jubileo, 2000 and other initiatives). I would also have to promote the Tobin tax which proposes a 0.1% taxation on financial transactions in the interest of directing this yield towards the development of nations where starvation is a part of the lives of the majority of people the were "randomly" born there. In the presence of this very wide subject, in this section I will only focus on propositions directed towards our own, nearby contexts. In other words, I will center my attention on developed or developing nations in the interest of relieving inequalities between population sectors with the help of concrete education policies.

Education institutions, above all public and state schools (understood according to the ideas presented by Gimeno, 1999a and 1999b), have a relevant role in the reduction of social inequalities provoked by the implantation of new technologies. This is true mainly if, as we have already seen in the previous section, the absence of training and instruction in the use of these products leaves people at a disadvantage or with inferior opportunities for social and personal development. In the end, if they lack these basic abilities to access the primary or essential functions of computer and multimedia technologies, they will not be able to prosper in developed nations. The importance of this observation stems from the fact that, more and more, we feel the presence of new technological devices in our societies even though we're still not certain if they improve or deform people's relationship with nature. To adequately deal with this presence, public education institutions, due to their social

function, must provide infrastructures and equal opportunities to all of society's members so as to allow them to obtain technological knowledge and competence

With regards to this general proposal, the concrete propositions to be developed by education centers are divided into the two following groups: first, with respect to the curricular contents dealing with computer and communication technologies that teachers and students must be familiar with and use; and second, with respect to the strategy we must follow in order to achieve the previous proposals.

### **a) Contents Dealing with Computer and Communication Technologies**

In a greater or lesser degree and with different nuances, there exists a certain unanimity in considering technological products as curricular contents for teacher training and for mandatory education levels as is seen concretely in the Spanish context (Sancho, 2000; Cabero, 2001; Gutiérrez, 2003; Area, 2004; among others). From my point of view, we should include at least three topics on the syllabus so that both teachers and students are familiar with and able to use computer and communication technologies, thus relying on values and perspectives that permit them to distinguish the primary from the secondary functions of each product of different technological systems. The first is related to the economic-labor dimension of technology. This topic should take us back in history to the industrial revolutions of the eighteenth and nineteenth centuries when the separation between land owners and workers was first established.

A second topic is related to the political-governmental dimension of technological development. This shows that artisans also suffered from the expropriation of the tools they possessed to construct and give meaning to their production labor. These tools were substituted by machines that artisans were not familiar with, and so, were used by land owners to control them. This was the beginning of control and governability processes, introduced into the labor world and then extended to other areas of social life. Finally, the third topic is derived from the social-cultural dimension of technological development. Here, it is necessary to set fourth the organizational changes produced in the labor world as a consequence of the development of devices and machines created to improve production processes, bringing to social life new ways of feeling and perceiving space and time, as well as the relationships between them. It must also be shown that the rise of technology has provided products designed to individualize, isolate and entertain the population.

These contents then, together with others of a technical or instrumental character, will be the basic elements in the training of teachers and students so that they know how to search for, select... and process information. In the same way, they will be relevant to their qualifications to use these computer and communication technologies in an innovative way in the labor and social world; and above all, these contents will help to make them more sensitive to the dangers that arise when new technologies are introduced in a sectarian way. This proposal is part of the revision of cultural elements that circulate in school systems, and which Torres (1999) proposes as necessary if there truly exists a commitment to the defense of ethnic and socially excluded groups.

## **b) Strategies to follow**

In order to achieve the previous proposals, it is necessary to follow determined strategies with respect to education policies and teaching methods. Regarding the former, these will be strategies directed at improving the distribution of scholastic opportunities in mandatory education, so that all students receive information about new technologies; that is, so they acquire knowledge, develop competence and values that will permit them to continue their studies in secondary education and, in the future, face and prosper in the social and labor world without difficulty. In this sense, following Muñoz Izquierdo (1997), education policies move in two directions—one "short term" and the other "long term". The first one is conceived to help stop or impede basic inequalities from increasing with respect to the knowledge and use of computer and communication technologies. This proposal should aid us in developing compensation programs directed towards population sectors that did not have the opportunity to be trained in new technologies when going through mandatory education, or simply received an inadequate education, or received no education at all, as is the case with immigrants, adolescents and adults who abandoned the system. This strategy responds to what Connell (1997) denominates as a logic of compensation whose purpose "is to provide additional resources to schools that help disadvantaged communities" (Connell, 1997; p. 74). This is achieved with proposals like the one Area (2001) suggests to systematically develop education policies in three environments: school systems, professional training and informal education. The long term strategies, on the other hand, are designed to change the education system in such a way as to make unnecessary the previous compensation programs. In this sense, information given by parents and part of the public school teaching staff (in Parla and Leganés, Madrid, Spain), show that one of the basic inequalities affecting students in public schools, as compared to private, is that students of private institutions have more cultural and scholastic opportunities in addition to other training possibilities that are backed by, together with other factors, the economic superiority of their families. Such possibilities or extra offers, are carried out within the school itself or as extracurricular activities (language courses, sports, art, new technologies, music classes, extra classes to help develop more profoundly one's knowledge of the different fields of study...). The majority of parents and teachers interviewed are deeply convinced that these extra activities offered to only a few groups of students can be compensated and avoided in public schools by offering the same training and instruction opportunities as in private institutions. They consider that a good compensation policy for basic existing inequalities related to new technologies and other aspects of culture, is to increase the educative offer in public schools. This must be done even though we have to extend school time hours by, for example, introducing extracurricular hours from 5:00 to 7:00. The establishment of such an education policy can follow different proposals according to the peculiarities of each center and its surroundings, although, according to those interviewed, local and community administrations should absorb the resulting expenses for the extracurricular hours (teachers, materials...).

In addition to the strategies to improve the distribution of scholastic opportunities in order to understand and use the primary functions of all computer and audiovisual products, we must consider those designed to prepare teachers and to teach such materials to the students. With respect to the first, San Martín (1995), Fierro and others (1989)... believe that teachers should be trained in processes based on the combination of practical observation and reflection of real situations in which they participate. In this way, the knowledge generate by teachers and students through reflection, will

be relevant and useful because it will become a means to face and to solve the difficult problems in their respective schools and surroundings. "Training in the audiovisual and technological fields should be composed of social and dialectical reconstruction of the scholastic environment...Analysis and reflection must permit teachers to situate themselves in their profession so as to adequately interpret the meaning and reach of pressures that schools are under to incorporate technologies" (San Martín, 1995; p. 255). Incorporating these ideas into the issues of this section, I see that the importance of the previous strategy resides in stemming from the necessity to resist and fight against social inequalities. This is a necessity that, at the same time, comes from the reflection and the consciousness of moral implications in the use of technological products in education.

Finally, with respect to the strategies followed by students, education policies must be oriented towards what Connell calls policies of social justice. Among other principles, he underlines the design of curriculums directed at the appreciation of the interests and perspectives of the least favored. These must be syllabi that embody the interests of those who suffer from a social disadvantage, principally because a common curriculum that includes the interests of all people, but which permits the existence of basic differences between groups, produces inequalities. All people implicated should participate in the elaboration of this curriculum because "a democracy is not possible when some citizens receive the decisions made by others" (Connell, 1997; p. 67). This would be the basis for a plan conceived to maintain human beings in a more natural relationship with their environment. With this idea, strategies are being developed in which parents, together with teachers and Local Administration officials, are implicated in their own education at the same time that they take an active role in the education of their children (Bautista, 2003 y 2004; Bastías, 1981; Escofet & others, 1998). Concretely, in the investigation in course since 1997 in a public school in Leganés (Madrid, Spain), we have achieved a space and a time within school hours (Thursday afternoons with sixth graders) in order to develop a group of subject matters related to cinematic and photographic languages (social functions, artistic dimension, publicity, audiovisual creation, analysis of video and cinematic discourses...). One of the most relevant aspects is that these processes were organized and managed by the mothers of the school. The value of the contents of this audiovisual syllabus resides in the fact that it was selected by the mothers themselves, based on the reflection over their own family histories, and also, on experiences they had during the sessions of audiovisual literacy conducted during the 1997-98 to 2002-03 academic years. In this context, teaching strategies are firmly established making practical-situational uses of new technological products. These are uses that permit students to become familiar with elaborate codes (Bernstein, 1993), and to develop an independence that allows them to face and to stop the spread of social inequalities.

The strategy followed in the Leganés School, in the same way as others, responds to the goals and possibilities to transform the aspects and internal dynamics that scholastic centers offer, as shown by Gimeno (1999a y 1999b). It is evident that the establishment of such a strategy which requires working with parents is complex and complicated considering the conditions in which education centers currently function. Teachers believe the general implantation of this idea to be a utopia, above all, due to the difficult situations that they are going through in their respective centers (negligence, lack of time to think, speak, discuss...). In this sense, basic education policies must be directed at the creation of conditions that make the aforementioned strategies possible, among other aspects, by improving and promoting the communication and participation of parents, teachers and students in the

making of decisions and the management of schools. Bourdieu (1999) ends his memoir of his investigation of misery with a language that strengthens the positions expounded in this section. Paraphrasing it, we could say that the previous education policies permit us to bring to light some mechanisms that make life painful and intolerable. Such a state of consciousness makes it possible for those who toil to know the social origin of their suffering and, in this way, feel forgiven. Bourdieu predicts that this knowledge will give hope to the most disadvantaged because "what the social world has done, armed with this knowledge, the social world can also undo... what is certain is that all policies that do not completely take advantage of the possibilities, few as they are, but offered in the interest of action, and which science can help us discover, can be considered guilty of not helping a person in danger" (Bourdieu, 1999; p. 559). This quote is a warning and a reminder to Governments about the responsibility they have in the fight against social inequalities. One of the ideals that could guide the previous education policies related to new technologies could be the one begun by the work of mothers in Leganés, which seems to give the possibility to enjoy sensitive moments and profound emotions that are beautiful and noble. This should be one of the references to help orient the direction of human decisions, a reference that provides people with a more natural relationship with nature, without so many interventions and dependencies due to the current globalization of information pertaining to developed and developing nations. Any kind of educative policy would be unjust if it did not attend to the ideals of these women; "Curricular subject matters are unjust when they reduce a person's capacity to improve the world" (Connell, 1997; p. 72). In the interest of improving the world then, it would be necessary to train people using the primary functions of all products of the different technological systems so that human beings achieve independence, autonomy and can break with the definitions of their subjectivities, with the categories where they are labeled and classified. In the end, to reach this goal, we must try to incorporate everything that I have set fourth in this article up to this final point.

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