

# Complexities of Cyberculture in Pierre Lévy and Developments in Education

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## Abstract

The term “cyberculture” permeates speech in various areas of contemporary society, referring to an issue that is extremely important, both because of its complexity, and because of its impact on cultural changes that affect all sectors of society today, and particularly education and educational processes. “Cyberculture” expresses the key elements involved in developing a digital culture that can be explored in all learning spaces and times. This article aims to analyze some of the complexities of cyberculture, using three works by the French scholar Pierre Lévy, namely: “Les technologies de l’intelligence” (1993), “Qu’est ce que le Virtuel?” (1996), and “Cyberculture” (1999). By detailing these complexities, we aim to make it easier for people and educational institutions to participate in the construction of the positive processes that cyberculture makes possible. Moreover, this fundamental discussion addresses society’s understanding and, from this perspective, aims to identify possibilities and opportunities to improve educational processes.

## Keywords

Society and Education, Cultural Transformation, Assisted Computer Training, Education Through Communication, Learning Methods

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## 1. Introduction

Several authors have devoted themselves to characterizing contemporary society. Among these is Pierre Lévy, a French sociologist and philosopher who was born in Tunis (Tunisia) in 1956. Lévy is one of the most prominent thinkers in the field of contemporary virtual culture. He completed his studies in France, receiving a Ph.D. in Sociology and Information and Communication Sciences. He taught in several French and Canadian universities and is an important con-

temporary researcher in the field of new digital media, as well as an enthusiast about the cognitive and anthropological possibilities inherent in the Internet.

Lévy (1999) defines cyberculture as a set of material and intellectual techniques: practices, attitudes, modes of thinking, and values that have developed alongside the growth of cyberspace. Understood as a synonym for “network”, cyberculture offers a new medium for communication, arising from the worldwide interconnection of computers. These definitions of cyberspace and cyberculture are sufficient to introduce the theme, although insufficient for an adequate understanding of the complexity of this field.

In his books (1993, 1999), Lévy defends the idea that cyberspace is a product of the real social movement of (cyber)culture, because the personal computer was created by Californian youngsters on the margins of the system who wanted to create new informatics bases to revolutionize society. Along with personal computers, digital networks were developed by groups of educated metropolitan young people; their ordered words and coherent aspirations represented strong cultural streams and promoted reciprocal communication and collective intelligence.

For the author, cyberspace is much more than just a resource or technical solution—it is one of the most fantastic examples of international cooperative construction, and the technical expression of a movement that began from the bottom, constantly fed by a multiplicity of local initiatives. It targets, through any kind of physical connection, a particular type of relationship among people.

As Lévy (1999) points out, Le Cyberspace constitutes an impressive achievement: the appropriation of the means of production by its very own producers. The advent of cyberspace places back in the hands of individuals the main tools of economic activity, which, in our age, are personal computers and digital networks.

Understanding the dynamics of cyberculture and the logic of cyberspace changes the way we notice concepts, and indeed, what those concepts represent for the future of humankind. Lévy (1993) affirms that, although technique is one of the fundamental dimensions of cyberculture and cyberspace, what is on the table is in fact the transformation of the human world by human beings. There is no well-defined, actual distinction between man and technique, or between life and science; those distinctions are created for the purpose of analysis. In using such concepts for precise purposes, we should not regard them as radically separated ideas. According to Lévy, we cannot express technique either in relation to moral condemnation or as a separate aspect of the group’s (or world’s) cultural signification change objectives.

## 2. Cyberculture

To better understand cyberculture from a perspective that combines technique, politics, and cultural projects, Lévy (1993) notes that informatics and cyberspace are products of the historical evolution of what he calls intellectual technologies or intelligence technologies. Throughout history, human beings created three

great types of intellectual technologies to express their intelligence: orality, writing, and informatics. Understanding the evolution of intellectual technologies is fundamental to understanding cyberculture, because they unmake and remake cognitive ecologies<sup>1</sup>, from which we derive the cultural foundations that command our apprehension of the real. In this study, the most relevant aspects of each intellectual technology will be presented.

For Lévy (1993), orality refers to the role of the word in the era before human groups adopted writing. In those early societies, the word was used not only for everyday practical communication, but to manage social memory, its core function.

According to Lévy (1993), in oral society, the most appropriate representations met the following criteria: 1) They were very interconnected: the information they shared was not organized in a modular or systematic way; 2) The connections between representations involved relationships of cause and effect; 3) Propositions referred to the domains of concrete and familiar knowledge; 4) The representations were tightly bonded with “life issues”, directly involving the subject and propelled by emotion. Thus, members of a society without any writing are not “irrational” because they believe in myths; instead, they use them as codification and memorization strategies.

For this reason, dramatization, personalization, and narrative artifices not only give pleasure to spectators, they are also the perennial conditions of a set of propositions in an oral culture. The time of orality has a cyclic character; the passage of time presupposes a never-ending movement of re-starting. It is a time of changing—the narratives alter according to circumstances, and transmission is always recreation. Inside a dimension of time and space, it is possible for orality to be restricted to the place and moment where it occurs. In addition, once it has acquired a very specific dynamic, it demands a communication process capable of superficiality, so that communication can be effective among all individuals who take part in it. Without this, discourse can lose its meaning for someone who has not mastered the theme being discussed.

The second intellectual technology defined by Lévy (1993) is writing, which added theory, logic, and the interpretation of texts to the mythical narratives of human knowledge. The creations of the alphabet, printing, and improvements in writing were essential for the establishment of science as a dominant mode of knowledge and world record-keeping.

Lévy affirms that writing, by interposing an interval of time between the transmission and reception of a message, generates a radically new situation in practical communications; for the first time, discourses can be separated from the private circumstances in which they were produced. For this reason, when ambiguous, out of context messages begin to circulate, meaning assignment

<sup>1</sup>Simplified, the concept of Cognitive Ecology developed by Pierre Lévy, is made up of agencies, interactive schedules, and constitutive relationships space, where individual, institutional, and technical cognitive possibilities are defined and redefined. Additionally, it is in the area of agencies that forms of knowing, learning, thinking, and developing new technologies and institutions are conserved or generated.

starts to occupy a central place in the process of communication. Interpretation starts to become very important.

As the text can be isolated from its private conditions of creation and reception, writers seek to build discourses that are sufficient in themselves. According to Lévy, writing notation became more comfortable to enable the conservation and transmission of separate modular representations, independent of rituals and narratives. Individuals in written cultures therefore tend to think in categories, while people in oral cultures first capture situations.

As we move from ideography to the alphabet and from calligraphy to printing, signs are placed in a sequential order on the page; this is why time also becomes more linear and historical, and history becomes an effect of writing. This shift gave rise to a new genre of knowledge presentation—the analytic method, which was diametrically opposed to the scholastic style. Once the subject began to be taught and included in manuals in a specialized way, it was projected onto a table or tree, cut into fractions, and afterwards distributed in a book as part of a general plan. Old manuscripts imitated oral communications (questions and answers, pro and con discussions), and were organized around a comment from a great text or proposed selected fragments and compilations. Gutenberg's press allowed a new cognitive style to be established, in which the silent inspection of maps, schemes, graphics, and dictionaries became, from that point on, the center of scientific activity.

Through writing, the relationship between communication in time and space is transformed. The message is no longer bound to a moment or a specific place, but to the duration and availability of support for writing, which tends to be perpetuated. From the point of view of a message's reach and its degree of complexity, writing also greatly amplifies the possibilities for distributing and understanding a message. On the other hand, immediate possibilities for dialog become weaker as the time and space between writers and readers expands.

Lévy (1993) presents informatics as the third intellectual technology, represented by computers and digital networks. Computers have a series of material devices and layers of software that re-cover and interface with each other. Those layers, which are innovations of informatics, derive from other fields, including electronics, telecommunications, laser and other sciences, mathematics, logics, cognitive psychology, and neurobiology.

It is important to emphasize that the invention of the personal computer came from outside, not just bypassing the great industrial manufacturers, but in opposition to them. That unpredictable innovation transformed informatics into a mass medium for creation, communication, and simulation. There is no stable identity in informatics because computers are networks of interfaces open to new connections; these are unpredictable, and can radically transform their meaning and use.

For Lévy, digital codification is already a principle of interface. We compose images, texts, and sounds with elements into which we incorporate our thoughts or senses. An image or sound can become a point of support for new intellectual

technologies; once digitalized, it can be decomposed, recomposed, indexed, and ordered within multimedia hyper documents. Such media can potentially be manipulated with the same facility that writing today can be edited.

At the heart of social media, it is possible to highlight four functions that will replace the old distinctions based on the press, radio, television, and telephone; they are: 1) The production or composition of data from software or audio-visual representations; 2) The selection, reception and treatment of data, sounds, and images; 3) Transmission through the digital network; 4) The functions of storage (Lévy, 1993). Along with these functions, a new hyper textual form of writing is now possible, one that will be closer to the setting for a spectacle than to the classic writing, in which the author is mainly worried about the coherence of a linear and static text.

Lévy (1993) points out that future authors will have the task of inventing new discursive structures, discovering the still unknown rhetoric of dynamic schemes, variable geometric texts, and animated images, where colors, sound, and movement will associate to signify. The context of the new intellectual technologies will be similar to that of the great printers of the 16th century, who were at once literates, humanists, technicians, and explorers of a new mode of organizing knowledge. The quantity of digital data available is constantly growing; the more it grows, the faster we must work to structure it and map it. In addition, the interfaces for finding and using data should be improved.

Lévy (1993) highlights the importance of the notion of real time, created by informatics technicians, which captures the spirit of informatics: a condensation in the present and ongoing operations. However, dynamic writings (hypertexts, multimedia compositions, and groupware) could reintroduce certain forms of historical distance and hermeneutic work within the task of interconnecting in real time, which is intrinsic to informatics.

Another issue that Lévy (1993) points out is that, in the case of informatics intellectual technologies, memory is so externalized and accessible that it raises the question of whether traditional notions of memory are still pertinent. Memory, by being computerized, is objectified to such an extent that the truth is no longer a fundamental issue, in comparison with operability and the speed of locating information. In written civilization, books and theory remained at the horizon of knowledge, offering stability and uniform belief in the true theory or the right explanation. Today's people would be alarmed at adopting even partial identification with a single theory. Instead, knowledge is in a permanent and vertiginous metamorphosis; theories give ground to models that are not written on paper, but created on a computer and amplified across a network.

For Lévy, the digital model is not read or interpreted as a classical text; it is generally explored interactively. It is plastic and dynamic, with a certain autonomy of action and reaction; it is knowledge produced by simulation. The manipulation of parameters and the simulation of all circumstances give the software user a kind of intuition about the cause and effect relationships in the model. In cognitive terms, one acquires knowledge by simulating a modeled system, which

resembles neither theoretical knowledge, nor practical experience, nor the accumulation of an oral tradition. Cognitive psychologists have hypothesized that everyday human reasoning has little connection to the application of rules in formal logic. It is more plausible to argue that people build mental models of situations involving the objects they are reasoning about, and afterwards explore different possibilities using those imaginary constructions.

Thus, simulation through models can be considered a form of computer-aided imagination. At the same time, it is a much more powerful tool to aid reasoning than formal logic, which is based on the alphabet. Simulation (imagination, mental bricolage, attempts, and mistakes) corresponds to the step in intellectual activity that precedes rational exposure through a theory, which is a more formal approach to presenting knowledge. From the dynamic understanding of intellectual technologies, it is possible to deepen the concept of cyberspace, which is a driving element of cyberculture, because it has been established in the context of informatics intellectual technologies.

### 3. Cyberspace

For Lévy (1999) cyberspace is not only the material infrastructure of digital communication, but also the universe of information it shelters and the human beings who co-inhabit and amplify that universe. In his vision, Lévy does not separate the technical and human aspects of cyberspace; on the contrary, he treats them as a single element. This universe should be understood as an interactive, community communication device, which encompasses every advantage and resource of the informatics intellectual technologies previously discussed. In cyberspace, the computer is not a center, but a knot or component of the calculating universal network. Thus, contemporary informatics is deconstructing the computer in favor of a transparent and navigable communication space, where every function is distributable and increasingly distributed. In this sense, cyberspace is becoming a privileged instrument of collective intelligence.

Intellectual technologies related to informatics and cyberspace power the essential concept of cyberculture that Lévy (1999) characterizes as universal without totality. Cyberspace is universal because it enables any person in the world, regardless of time and space, to create a part of it—it has no center or guidelines. It accepts everyone, because it is content to connect any given point with any other, regardless of the meaning of the related entities. It is without totality, because an undetermined universe that tends to keep it indeterminate. Each new knot in the network of networks in constant expansion can become the producer of new and unpredictable information, and can thus itself reorganize a part of global connectivity. In addition to the idea of being universal without totality, another fundamental way of understanding cyberculture is to think of virtualization as a potential state of things.

### 4. Virtualization

Virtuality constitutes the distinctive trait of the new face of information pro-

vided through informatics and cyberspace digital technologies. Lévy (1996) affirms that digitalization is the technical basis of virtuality. It not only affects information and communication, but also bodies, the economy, sensitivity, and the exercise of intelligence (through virtual communities, virtual companies, and virtual democracy). Although cyberspace as a technical infrastructure has an important role to play in that process, it is a phenomenon that far surpasses informatization.

The word “virtual” is often used to mean that which does not exist, generating an erroneous and dichotomist vision that separates the virtual from the real. In that vision, “real” presupposes a material effectuation, a tangible presence, while “virtual” signifies the pure and simple absence of existence—an illusion. Such an understanding presumes that everything is either real or virtual, because it is not possible to have both properties at once.

Lévy (1996) demonstrates that, in the philosophical conception, a virtual thing exists only potentially and not in an act; it is not the opposite of “real”, but of “actual”. Virtuality and actuality are two different modes of reality. The tree, for instance, is virtually present in the seed; therefore, the virtuality of that tree is very real (without being actual). Lévy (1996) affirms that every deterritorialized entity is virtual and capable of generating several concrete manifestations in different distinct moments and places, without being stuck in any particular place or time. A single word, for example, is a virtual entity—it is always being spoken in one place or another, at a certain day or time. When we use the word in a specific situation, we are performing an actualization, which is a process of resolving that situation; the word itself is not anywhere and is not connected to any particular moment.

Actualization appears for Lévy (1996) as a momentary situation to resolve a problem; it is the creation or invention of a form from a dynamic configuration of forces and purposes. Virtualization is the inverse of actualization—not a de-realization, but a mutation of identity. In other words, the entity starts to find its essential consistency in a problematic field. Thus, virtualizing an entity involves discovering a general issue that it relates to, and making the entity mutate towards that question. The process of actualization moves from a problem to a solution, while virtualization moves from one given solution to (another) problem. Thus, virtualization is one of the main vectors of reality creation.

The invention of new speeds is the first degree of virtualization. Lévy (1996) reports that the acceleration in communications is contemporaneous with an enormous growth in physical mobility, paralleling the wave of virtualization. Another characteristic of the virtual is the so called Moebius effect, through which the interior changes to the exterior and the exterior to the interior, for example, in the relationship between private and public, proper and common, map and territory, author and reader. Clear borders give way to a fractalization of repartitions, with the passage to the problematics, displacement of being into the issue. It is something that questions classic identity and thought based on definitions, determinations, inclusions, and exclusions. This is why virtualization is

always a process of welcoming change.

Lévy (1996) highlights three concrete cases: the virtualization of body, text, and economy. In this text, we have chosen to analyze thoroughly the first two examples, body and text, as these are more closely related to the complexities most likely to affect education.

One way of thinking about the virtualization of the body is that we can be—at the same time—here and there, through techniques of communication and telepresence. Another concept is that we virtualize the body medically, using equipment of medical visualization that makes our organic interiority transparent, while grafts and prostheses mix one body with the bodies of other people and with artifacts.

Lévy (1996) affirms that, as with knowledge and the economy, the virtualization of our bodies has introduced a new step in the adventure of self-creation that supports our species. Our perception, for example, which helps to bring the world to wherever we are, has been externalized by systems of telecommunications. The telephone for hearing, television for seeing, tele-manipulations for touching, and sensorimotor interactions are all devices that virtualize our senses. Virtual reality systems allow us to experience another person's complete sensorial experience, regardless of where we are.

As to the virtualization of text, Lévy (1996) argues that text is always a virtual, abstract object, with no specific support. It is actualized in multiple versions, translations, and editions. By interpreting and giving meaning to a piece of text in the here and now, the reader continues to perform actualizations. For Lévy (1996), the text is full of holes, because it has fragments that we do not understand or connect with others, and that we neglect. In that sense, reading is beginning the process of neglecting elements. In addition, when we read, we construct the meaning of the text and also relate it to other texts, images, and affections, until it is no longer the meaning of the text that occupies us, but the direction of our own thinking and the culmination of our projects. When we read, there is soon nothing left of the text for us; at best, we use it to retouch our own models of the world. In other words, when we read, we are constructing ourselves and embodying the text within us. The text serves as a vector, support, and pretext for the actualization of our mental space.

In considering the virtualization of text, it is important to analyze the characteristics of hypertext, which is the text that emerges from the symbiosis with informatics intellectual technologies and networks. Lévy (1999) affirms that hypertext is the opposite of linear text. As a structured text in a network, it represents a new art of editing and documentation. In conventional writing, the initial text is already there and complete. By contrast, hypertext is a matrix of potential (possible) texts, some of which will be realized only during interactions with the user.

Lévy (1999) argues that the virtual nature of a piece of text only occurs when human subjectivity enters the circuit, giving the text an indeterminate meaning and the propensity to signify, a tension that an actualization (interpretation) can

resolve through reading.

The hypertext that is accessible through a network of computers is a powerful instrument of collective writing-reading, according to Lévy (1999). It becomes important, because its digitalization and new forms of presentation give us access to other ways of reading and understanding. Thus, if the computer is considered a tool for producing classical texts, it will be nothing more than a practical instrument. If we consider the group of all texts that the reader can automatically release using one computer and a digital network, we enter a new universe of creation and symbol reading.

For Lévy (1996), the use of informatics to produce hypertexts brings about cultural change, allowing the rise of new genres connected to interactivity. Hypertexts with digital support allow new kinds of collective readings (and writings), embodying a change from an individual reading of a precise text to navigation in wide digital networks, where a great number of people annotate, increase, and connect texts with one another.

This new kind of text objectifies, operationalizes, and amplifies the power of the collective and the crossed identification of the reader and the author. In this context, every reading becomes an act of writing. Hypertexts in digital networks do not have clear borders; there is no longer a discernible and individualizable text—the hypertext is a text that is closer to the movement of thinking.

Thus, Lévy (1996) argues that the use of dynamic supports for informatics can encourage the invention of new writing systems to better explore the new potentialities of digital hypertext. We are in the era of writing digitalized, fluid, reconfigurable text, in a non-linear way; each participant is a potential author. Thus, far from annihilating the text, virtualization allows new forms of writing and reading. It is practically a newly invented form of writing that is just starting to present traits of orality.

## 5. The Complexities of Cyberculture

From Pierre Lévy's characterization of cyberculture and the issues it raises, we can see that contemporary society is facing a series of new complexities created by the changed thinking that has arisen from the creation and use of the intellectual technologies of informatics and cyberspace.

The term “complexity” refers here to issues or situations triggered by changes in society, which implicate, either directly or indirectly, the reality of people and institutions. As these are generally new situations, we often have no real understanding of the dimensions of their inherent implications. This paper therefore understands as complexity every new issue or dilemma that arises and is difficult to solve, especially because it is new and therefore harder to understand.

A great mistake that people often make when attempting to understand cyberculture is to imagine it as a movement created by a particular group of informatics technicians who created computers and social media. Still pursuing this line of thought, another view holds that cyberculture arose from the creation and use of social media. This is a very partial and technical view of cyberculture.

It is necessary to invert that logic and recognize that it was human cyberculture, which is dynamic and constant evolution that gave rise to computers and cyberspace through a true social movement aimed at revolutionizing society. The mission of giving a large number of people access to computers had as its goal the appropriation of the means of production by the then consumers. At that same moment, with the creation of computer networks, another objective emerged—the desire to democratize reciprocal communications and create a new infrastructure to support the development of collective intelligence.

Once cyberspace is understood as part of a process that seeks to emancipate, rather than separate human beings, people will probably notice the potential of this new communication space. To actively explore the potentialities of cyberculture, it is necessary to understand that we have already had societies of orality and writing; today, we are in the society of informatics intellectual technologies and cyberspace, which ends up virtualizing the two first societies. In addition to the text, we can use images or sounds that, once digitalized, can be decomposed, recomposed, indexed, and ordered inside multimedia hyper documents.

Now a new form of multimedia and hyper textual writing is possible, although it will be closer to a setting for a spectacle than to classic writing. It is now necessary to invent new discursive structures to discover the still unknown rhetoric of dynamic schemes, variable geometric texts, and animated images, where colors, sound, and movement will associate to create meaning. These are the tasks that await the authors of the future.

This does not mean that we have completely abandoned orality and writing; on the contrary, they co-inhabit and are potentiated by the new possibilities of informatics intellectual technologies, now being configured in new dynamic writings. These new writings, in contrast with traditional texts, are explored interactively and can be composed of simulations through models that might be considered forms of computer-aided imagination. They are made up of many more powerful tools that support reasoning than the old formal logic the alphabet was based on.

Another complexity of cyberculture is the number and richness of resources that cyberspace offers to those who truly manage to understand its meaning and potentialities. When one understands that cyberspace is not just the material infrastructure of digital communication, but also the information it shelters and the human beings who navigate and feed that universe, one sees that it is also an interactive and communitarian communication device, and a privileged instrument for the development of collective intelligence.

Cyberspace presents the concept of the universal without totality; when we understand this more deeply, we will notice that it represents a step in the evolution of mankind. It has no center or guidelines; it accepts everyone, because it is content to connect any given point with another, regardless of the meaning of the related entities.

In addition to the complexities already presented, virtualization is one of the most distinctive issues related to informatics and cyberspace. Digitalization

enables virtuality, but widely surpasses informatization; it is involved not only in information and communication, but also in bodies, the economy, sensitivity and the exercise of intelligence. To explore the potential complexity of virtualization, it is necessary to clearly understand its meaning, rather than interpreting it as the opposite of real.

Virtualization does not involve working with unreal things. Instead, it is a passage to that problematic, seeking the displacement of people for the issue—in other words, a process that questions classic identity. Thus, when we understand more deeply the idea that virtualization is always a process of welcoming change, people will more easily realize that they can engage in the construction of positive processes through virtualization and cyberculture. It is therefore possible to understand virtualization as the potential ability to perceive and transform the world.

From the great wave of virtualization, a few concrete cases can be explored; these have made society more complex by including the virtualization of the body, text, and economy. One of the main issues that relates to virtualization of the body is that we can be here and there at the same moment, through techniques of communication and telepresence. This means that we can carry out a series of activities without being physically present in a certain place.

Thus the virtualization of the body cannot be understood as a dematerialization of the body; the idea that, because of informatics and cyberspace, we would eventually live in front of our computers and no longer use our bodies—that prediction has not come true. In fact, the opposite has happened: as cyberspace allows us to move quickly between places, we want to do the same thing with our physical bodies. Not at any other time has human mobility been so great.

Another complexity is the virtualization of text that has had its potentiality increased through the use of informatics intellectual technologies and the creation and manipulation of hypertexts. This is complex because it is important to understand that the text in the networks (hypertexts) has a different structure and meaning from traditional texts. Open hypertexts, which are accessible through a network of computers, are powerful instruments of collective writing-reading, allowing other ways of reading and understanding. Therefore, the hypertext operationalizes and amplifies the power of the collective and the crossed identification of the reader and the author, allowing every reading to become an act of writing. In this case, the complexity is that there is no longer a distinction between readers and authors.

Thus we should notice that hypertext with digital support generates new kinds of collective readings (and writings), which are different from individual readings of a precise text. Hypertext allows navigation in wide digital networks where a great number of people annotate, add to, and connect texts with each other. As hypertext allows a large number of people to participate as authors, while also enabling new readings and writings in groups, it constitutes an instrument that helps to bring about man's emancipation.

## 6. Final Considerations

This paper has presented the complexities of cyberculture that we consider im-

portant for understanding contemporary society and improving modern education. Based on the studies of Pierre Lévy, we have discussed issues that are part of the context of cyberculture, and serve to make modern society more complex.

By analyzing cyberculture and its own relationship with institutions, especially educational ones, we can come up with the following questions: Are educational institutions prepared to welcome and address the new issues that cyberculture has created? Are schools organized to observe the principle of the universal without the totality of cyberspace?

Those questions reveal that most educational institutions, most of the time, are not prepared or structured to handle most of the complexities of cyberculture. One possible reason is that most have been trained to teach intellectual writing technologies, which have existed for centuries. These are completely different from informatics technologies.

In addition, it is necessary to understand cyberculture—not just from the perspective of authors like Pierre Lévy, who defend a relatively optimistic view of contemporary society—but so that education professionals can improve their work as educators. We must analyze all aspects of cyberculture within the larger and more critical context of contemporary society. In other words, we must question ourselves to discover whether society is really improving people's life conditions.

To sum up, we conclude that the complexities should be further studied and analyzed so that cyberculture can be better understood. Analyzing the work of thinkers like Pierre Lévy is an important step in that direction. Such an understanding makes it possible to reward institutions, while exploring the most positive potentialities of informatics intellectual technologies, cyberspace, and cyberculture.

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