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The Pedagogy of Interactivity
Pedagogía de la interactividad

This paper analyzes the pedagogy of transmission, with its unidirectional nature and features that it has in common with traditional media, and the pedagogy of interaction, one of participation, dialogue and co-authorship which harmonizes with the principles of Web 2.0. New media have implemented new communication models that allow every citizen to become a potential media communicator. This communicative ecosystem suggests a society of communicators in which everyone feeds each other with his or her creations and shares individual and collective knowledge. We review communication practices that utilize feedback as a strategy of interaction, when in fact these practices still favor the perspective of the sender. We then propose a model for the collective power of knowledge called the «feed-feed model», based on the individual and collective construction of knowledge. This knowledge, which can be organized in a virtual or real setting, characterizes the fundamental principles of interactivity, even though some sectors still view these as marketing strategies. We examine the virtual silence that exists in the culture of participation, and its implications for educommunication. The article concludes with a search for other pedagogical models, and the analysis of the consequences of perpetuating the transmission model in the face of the possibilities offered by the pedagogy of interaction.

En este artículo se analizan la pedagogía transmisiva, caracterizada por su sentido unidireccional, que tiene algunos rasgos comunes con los medios de comunicación, y la pedagogía interactiva, caracterizada por la participación, el diálogo, la coautoría que tiene rasgos comunes con los principios de la Web 2.0. Los nuevos medios ponen en práctica modelos comunicativos que permiten que cada ciudadano pueda ser, potencialmente, un medio de comunicación. Este ecosistema comunicativo permite pensar en una sociedad de comunicadores donde todos alimentan con sus creaciones y participaciones los saberes individuales y colectivos. Se hace una revisión de las prácticas comunicativas que utilizan la retroalimentación (feed-back) como estrategia de interacción, cuando en verdad no dejan de ser un refuerzo planteado desde la óptica del emisor, y se ofrece una propuesta centrada en la alimentación de saberes colectivos que denominamos «modelo feed feed», basada en la participación individual y colectiva para la construcción de conocimientos. Estos saberes, que pueden organizarse presencial o virtualmente, caracterizan los principios fundamentales de la interactividad, que para algunos sectores no deja de ser una estrategia de marketing. En la cultura de la participación se hace referencia al silencio virtual y a sus consecuencias en el campo de la educomunicación. El artículo concluye con las búsqueda de otros modelos pedagógicos, y con el análisis de las consecuencias que implicaría seguir reproduciendo el modelo transmisivo frente a las posibilidades que ofrece la pedagogía de la interactividad.

Transmission, participation, interactivity, virtual silence, feed-feed model, communicative models, knowledge construction.
Transmisión, participación, interactividad, silencio virtual, modelo feed-feed, modelos comunicativos, construcción de conocimientos.

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1. Introduction

In the majority of face-to-face or virtual courses it is the information transmission model that predominates. Virtual learning spaces are static and still centered on data distribution methods that eschew interactivity and collaboration in their set-up, not to mention constructed and connected learning.

Pedagogy based on learning by memory and repetition is widely questioned but little has been done to modify the practice. Now, adding to the tradition of pedagogical criticism, come the cognitive and communicative demands of a generation raised on cyberculture.

In online education, the teacher continues to treat the student as a receiver of information and not as collaborative agent. He fails to recognize exchange and co-creation, which are pervasive practices in cyberspace. He continues to use the «logic of distribution» that is a common feature of the mass media and fails to tap into the communicative potential of the Web. Discussion rooms and e-mail may exist but the level of interaction is poor, and the transmission and analogical model still influences the digital conversational context.

This article adopts a critical stance towards the communication model that holds sway in face-to-face and virtual education in order to propose strategies of organization and functioning for mediation that will allow the actions of students and teachers to be redefined as agents in the learning and communication process, in harmony with the Net's communicational dynamic.

2. The pedagogy of transmission

Since the second half of the 20th century the pedagogical transmission model has been under attack for its one-way or false two-way transmission based on functionalist models of communication that divide senders from receivers, and in which feedback is nothing more than sender reinforcement. McLaren and Kincheloe (2008) propose a dialectic transformation that affects all actors in educommunication which requires the development of knowledge self-management systems. Along these lines, Kaplún (1998) stated that learning only really exists when there is a process; when the student manages his own learning.

More than 40 years ago, Porcher (1967: 24) was already pointing out that schools were educating students for a world that no longer existed. This situation has deteriorated over the years to the point where we now have the notion of «the school as museum» with its teaching of the usual prevailing culture, as opposed to the idea of education taking place outside the classroom and beyond school culture.

The predominant school system today is based on industrial society logic in which the school's principles are still centered on manufacturing and the teaching-learning processes defined by Illich (2002: 43), as if school was «an assembly line of 30 to 50 individuals around a central figure who determines what is, and what is not, education». For Tapscott (2010), the pedagogical model that still operates today was conceived within the context of the industrial society which needed operators who did what was required of them in a fragmented mass production process.

This model based on mass learning differs substantially from learning environments in which other pedagogical and communicative practices are developed. Tapscott states that the end of the 20th and start of the 21st century witnessed the spread of pedagogical practices focused on the student and based on collaboration and solidarity between students. This author compares some of the features of the model based on mass learning and the model based on interactive learning.

Mass learning	Interactive learning
Teacher-centered	Student-centered
Standardized, *en masse*	Personalized
Instruction: teach something to be learned	Discovery: learning to be
Individualistic learning	Collaborative learning

Tapscott (2010: 163).

Various authors (Silva, 2010; Tapscott, 2010; Santaella & Lemos, 2010, Aparici, 2010) declare that the industrial pedagogical model is so deeply rooted in daily teaching practice that a real change will be a long time in coming. Computers and the Internet are still used according to an educational system in which it is teachers who transmit content. This hegemonic transmission paradigm is countered by a dialogical practice that is gaining ground outside the classroom. Aubert et al. (2008: 31) describe this situation thus: «In today's information society, it is thanks to dialogue with «non-experts» that more inclusive scientific theories have been developed. No expert exists who possesses all the social and cultural knowledge required to make proposals that are fit for all. We can all contribute ideas based on our various experiences and cultural

resources». They add that this «phenomenon of questioning the monopoly of knowledge has been described as the demonopolization of expert knowledge».

Similarly, García Canclini (2007) indicates that dialogic communication via virtual networks changes the way people relate to and meet up with each other, how they love and learn to be loved, or at least imagine how they do.

3. The «feed-feed model»

The hegemonic communication model applied by conventional media and educational systems is centered fundamentally on the sender-receiver-message relation. The basic principles of this model combine the concept of feedback between the participants in a model that establishes a division between the senders and receivers. Feedback acts as a strengthening of the messages from the information source and reproduces the pathway and guidelines of the message. This model is evident in the media from the starting point of audience loyalty to a medium, program-product, etc, and in education, in which the information pathways laid down by teachers and / or text books are followed or reproduced.

For many years, feedback has been seen as the interaction between sender and receiver, and the communicative relations between participants are analyzed based on those pre-established and predetermined responses. But the feedback idea is developed, designed and articulated from the viewpoint of those who provide the information.

Feedback is seen as one of the principles of the functionalist models of communication and the pedagogy of transmission. The type of interaction established between all the participants is fixed beforehand, and serves to inform of the «success» of the objectives proposed by the sender. This model does not take into account that all the participants can be subjects of the message, and can set up a sender community in which they interrelate, each with the same communicative status as the others.

The current communicative context can be described as a «feed-feed model» (Aparici, 2011) in which all the participants in the communicative process feed each other in terms of communication and information. Rather than being a process of message reinforcement, it must be understood as an act of construction and connection between all «Internauts» in which there are no divisions of any kind, all participants having the same rank and status regardless of the type of messages and proclamations they make.

Several similar ideas emerged that predated the construction of a different communication model to integrate the subjects of communication. In 1973, Jean Cloutier presented his «emirec» theory of an individual who is simultaneously a sender and receiver. In 1980, Alfin Toffler coined the term «prosumer» for a person who was both producer and consumer of messages. Although both ideas set important precedents for the construction of an alternative model of communication, they separated sending from reception, and production from consumption.

The new media contain a communication and information ecosystem of a different order in which all individuals are potential senders who can continually create content and interrelate on the basis of conversational participation instituted by the senders themselves in, and with, the various communication tools.

The Web is not a medium for the transmission of information like television, the press or the radio. It is a medium for immersion and the control of mobile windows, open multiple connections between content and those who interact, those who are geographically dispersed and who can carry out collaborative actions and meetings that are synchronic and asynchronic, far beyond the time and space relations to which conventional media are bound. The digital scenario is a field of possibilities for interaction based on sounds, images and text. Its existence conveys the freedom to interact, create and recreate new possibilities for representation and navigation in many different directions.

Understood as such, the Web enables the pre-established size and categories of messages, sending and reception to be changed, together with the distribution and diffusion of the packages of information articulated in a structure that goes from A to B or from A in B, so typical of the conventional media traditionally used in distance learning or in face-to-face teaching.

In the context of the conventional «communication» media, the message is one-way and closed since reception is separated from production. In this model, the sender is a subject, an institution or group that invisibly imposes on the receiver's mental universe, imaginary world and his representational construction, in which the receiver maintains an unequal relationship with the sender, one based on passive assimilation removed from the message.

The logic of mass transmission loses its validity in the digital environment, which is shaped by the recent social and technological transformations and by the old role of the spectator now transformed into one of participant in the processes of communication and production.

Various authors (Martínez Pandiani, 2008; Lemos & Levy, 2010; Shirky, 2011) point out that in recent years there has been a migration away from the TV screen to multiple screens that enable different degrees of participation in which users can intervene, manage and interact, and create and feed their communicative experience. In this communication ecosystem, the subject can create and control the interaction processes with information and interface management tools.

Radically different from television which is a restrictive, centralizing machine designed to transmit information manufactured by a production center, the Net is an open space for users to interact, allowing for authorship and co-creation in the exchange of information and the construction of knowledge. This socio-technical landscape sees the transition from the information logic of the «one-to-all» model (transmission model) to the communication logic of the «all-to-all» model (interactive model). This is a profound change in the classic communication scheme based on:

a) An ecosystem of senders that do not broadcast their messages unilaterally.

b) The message no longer simply being sent; it is no longer a closed world, paralyzed, immutable, untouchable, sacred; it is an open world on the Net; it can be modified by anyone who uses it.

c) A transformation of the classic role of the receiver into co-author. This new subject is invited to freely create, and the messages can take on new meaning in the hands of these subjects.

4. Participation and interactivity

Shirky (2011) and Jenkins (2008) stress that creating a participative culture for the common good is much more difficult than sharing photos and music files, etc. To participate normally requires a high degree of connection, commitment, collaboration and solidarity among members of a community. Dussel (2010), citing Ito, notes that there are two types of participation in the new media: one is guided by interest (groups of fans, for example) and another is influenced by affectivity and friendship. These two modalities can operate simultaneously or independently.

The term «user» does not reflect the new reality we are living in. Its use continues to perpetuate the distinction between editor and consumer. Likewise, authors such as Karp, cited by Vacas (2010), state that those who create blogs or webpages on social networks are editors, and these people behave like professionals regardless of the results. This idea emphasizes the expressive and communicative possibilities that citizens now have, as opposed to the aesthetic and communicative dimensions that for some mean a deterioration of the canons of technical and aesthetic quality.

The «one-to-all» model applied by the conventional media and educational systems will continue to exist for a long time but the dialogical «all-to-all» model in the digital media and the social networks will also gain ground.

According to Lemos and Lévy (2010), the use of social networks consists largely of banal exchanges, but there is an increasing amount of content that raises the quality of information. These authors state that for centuries, «the masses were just that: formless multitudes with no opportunity to produce information or content, forever chained to the role of consumer» (Lemos & Lévy, 2010: 86). Now for the first time, the situation is totally different. They can be authors and producers, but it will take time for them to assume this new creative and productive role.

It is important to note that a society in which everybody has access to the public space and in which each person can potentially become a medium of communication differs from those societies in which the citizens relate to the media only as consumers. The bigger the social network system, the greater the difference between those who are more active and those who are less active in the communicative processes.

4.1. The principles of interactivity

The term «interactivity» became notorious in the 1980s with the expansion and spread of information and communication technologies (ICT). The concept of interactivity means:

a) User intervention in the content.

b) Transformation of the spectator into actor.

c) Individualized dialogue with the connected services.

d) Reciprocal actions in dialogical mode with the users, or in real time with the devices (each communicator responds to another or to the other communicators).

The highest concept of interactivity is associated to the greatest acceptance of communication. The two terms can be synonymous: the term «interactive communication» would be redundant were it not for the need to accurately describe «communication», since to communicate does not mean to transmit or to manipulate (Silva, 2005).

Santaella (2007) says that interactivity in the Net enables us to access information at a distance that is non-linear, to send messages that remain available for receiving with no hierarchical values, to carry out collaborative actions and act in remote places, to visualize faraway spaces, to coexist within real and virtual contexts, to belong to and interact within virtual environments via different immersion processes. There are three basic principles of interactivity:

a) Participation-intervention: to participate is not just to respond «yes» or «no» or to choose a predetermined option. It means interfering, intervening in the content of information and modifying a message.

b) Two-directionality-hybridization: communication is the joint production of sender and receiver, it is co-creation; the twin poles of codification and decodification come together as one.

c) Permutability-potentiality: communication means a lot of articulatory networks of connections and the freedom to make changes and associations, and produce multiple meanings.

These principles can cause a rupture in the logic of transmission and open a space for the genuine exercise of participation, that is, sensory-motor, semantic participation that is not only mechanical (Silva, 2005; Aparici, 2010).

We observe how interactivity is now the biggest challenge faced by the mass media because with an increasing number of the public now internauts, they will not confine themselves to being mere receivers, to see, hear, read; they want to interact and be the subject of communication. It is also one of the greatest challenges to the educational system in terms of developing and activating models and practices based on interactivity, because interactivity affects the principles of knowledge construction and the micropolicy of power, and the establishment of new unprecedented forms of teaching and learning at a mass level, except in the case of particular experiences developed by communicators or pedagogues in specific contexts or spaces.

In the past 30 years, the term «interactivity» has passed through various stages:

- A period that produced many theories on the possibilities of creation and user autonomy in the face of standardized messages. It is important to note that the purged meaning of interactivity goes back to the «participationist» art of the 1960s defined by Umberto Eco as «open work».

- A technocratic period that identified interactivity as the relation of the individual to the machine and its navigational possibilities.

- A period of banalization, when the term «interactivity» was used above all as a marketing strategy to sell products. This period saw the application of the term to the most varied consumer products. There was even talk of being a member of an interactive school just for possessing a computer and Internet connection without having shaken off the transmission pedagogy that characterizes it.

A period of reactivation, of going back to the roots, linked to «hacktivism» and social movements. From 2004, Web 2.0 provided the communicational opportunity to put into action a model and practice that differed from the usual standardized offerings, in which each person could potentially be a medium of communication. From this moment on, the potential of citizen authorship was perceived in which users or consumers could become editors, producers or authors. One could now talk of the gestation of a society of communicators (Aparici, 2011).

There are sectors in society that criticize the term «interactivity» because they identify it with a marketing strategy aimed at influencing public opinion to link the media as «intelligent instruments» or which added something beneficial to the qualities of a product. As well as a «culture industry», many would now also see an industry of interactivity understood as an industry of participation that seeks to guarantee consumer loyalty to a product, to a medium or to a political party.

4.2. Virtual silence

One aspect not usually addressed when speaking of the interactivity of the culture of participation is virtual silence. What Burbules and Callister find most curious about the Internet is its silences. These authors state that many ideas and viewpoints are missing from the Net and many people and groups are not represented. They urge us to «question the Internet given that one of its main features is the illusion that it is all-embracing, and this illusion is so widespread that it is difficult to imagine that something of any importance could be excluded» (Burbules & Callister, 2008: 129-130).

Research by Ilse Gonçalves (2003) into different internaut communities made up of Spanish and Brazilian students communicating at a distance, whose ages ranged from 30 to 45, found a difference between participants who felt the need to integrate, to be dynamic and committed and those who did not participate or offer opinions, and who did not know how or with whom to contribute. One key aspect of this research was to point out that virtual silence is inherited from the transmission model of teaching that helped shape these participants. Some indicated that they had serious problems when trying to interact because they had

been educated exclusively to assimilate knowledge, and they recognized that their creative, communicative or expressive dimensions were left underdeveloped by their educational processes.

5. The search for other models and pedagogical proposals

A teacher can establish relations of communication and the production of collaborative knowledge in which everybody learns with everybody else, as opposed to the one-to-all model that rules in education and the media. This means that the dominions of knowledge have to be modeled as conceptual spaces in which students construct their own maps and lead their own explorations, taking content as a starting point and not the finishing point in the process of knowledge construction. Student participation is described as potential states of knowledge that are designed in collaboration. The student is not limited to seeing, hearing, copying and doing examinations. The student creates, modifies, constructs and becomes co-author, and handles a series of elements to enable the construction of collective knowledge.

The teacher offers a range of possibilities and pathways that open up when the students activate communication devices. The teacher ensures the possibility of free plural meanings without discarding coherence and its accompanying critical faculty. The teacher must be open to any extensions and modifications proposed by students. Pedagogy based on that disposition towards co-authorship and interactivity implies the termination of one model of teacher and the birth of another in which the teacher is democratic and expansive in outlook. This means that the teacher must apply his critical faculties to intervention and modification, which implies a dose of humility. This does not mean weakness or a lessening of his authority or vocational impulse. Be it in the classroom or online, the teacher must be aware that knowledge is not centered on the massage or content transmission (Silva, 2010).

In the digital age, the actors in communication are no longer restricted to separate sending and receiving, a feature of mass media or «written culture» in which the author and reader do not interact directly. A teacher can change the dimension of his authorship by replacing the speak-dictate system based on the one-way distribution of information with a perspective in which the proposition of knowledge is open to the active participation of the students, most of whom have already experienced other models on the Net and on their mobile phones. In sum, a teacher is responsible for mediating in the construction of another kind of thought, reinventing a new architecture of knowledge and, to a certain extent, reinventing the profession of teaching.

6. Conclusions

In this time of conflict and transition for educational systems, we observe that while the school represents sluggishness, reflection, slow action, simultaneous group work and promotes a certain type of individual authorship of production and classification, the new communication ecosystem proposes immediacy, acceleration, emotional shock, intuition, collaborative work, rapid interaction, the individual screen and a form of group authority.

Dussel (2010) examines this dilemma over the meaning of culture inside and outside the classroom by describing four major dimensions that are appropriate for these environments:

a) The school recognizes the function of the individual author while participatory culture and collective production on the Net create other canons regarding the process of co-authorship and collective intelligence.

b) The school promotes the rational over the emotional, while feelings and emotions are what stand out in the social networks.

c) The school shows, sees, verbally defines, while simulation and immersion are the key characteristics of the Net, as technology converges and many and varied languages are integrated.

d) The school centers its knowledge on the teacher, the curriculum and the text book. The Net, meanwhile, is a huge archive, a library of varied knowledge and immeasurable hypertexts.

These two contexts of culture inside and outside the classroom define the crossroads at which educational systems find themselves at the start of this 21st century:

To continue to reproduce the transmission pedagogy that Freire (1985) characterized as a system that dictates ideas in which no real debate or discussion of topics occurs, in which an order is imposed on the student that he does not share and which offers him no means with which to really think because he receives given formulae as if they were cooking recipes, or, to introduce the pedagogy of interactivity in which everyone learns with everybody else in a context of uncertainties that requires all those who participate in a process of real communication to make an effort to recreate and invent. As Kaplún (1998: 51) anticipated, «it is only by participating, getting involved, investigating, asking questions and looking for answers, discovering problems and resolving them that we can really attain knowledge. Learning comes from experiencing, creating and inventing, not just from reading and listening. Real learning only occurs when there is a process: when the student manages his own learning».

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