

A toward a multicultural model of science communication and technology: the respect of traditional knowledge

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Abstract

There are various problems concerning the communication of science, one of which, the most important for the development of this work is not to be conceived as a linear activity, ie, where only important to publicize the benefits of science but should also consider the issues that surround the scientific topics. In this way, I believe that not only is important to transmit scientific knowledge but also give rise to different types of knowledge, with this I mean wisdom and traditions, which are immersed in a multicultural society like ours. The problem is that the separation established between indigenous or traditional knowledge and science, because it is implicit an act of valuation of parts and devaluation of the other, is totally asymmetric and generates profound inequalities (Carrillo, 2006: 13). In this sense, the main thesis consist outline a model of science communication in a multicultural society.

In this regard, in a second part presents the main communication model of science and technology, with the objective of describing the problematic that exist in current models of communication within a multicultural society, as neither of these models meets the needs of the different actors of the company.

In the last part, are describe the basis on which development the model multicultural communication of science and technology. In the last part describes the basis on which the model multicultural communication of science and technology. In the first instance, I describe what is multiculturalism, how it develops in a liberal democracy and how a republican democracy, what democracy is more feasible to propose a model multicultural

communication of science and technology as well as the coexistence of both knowledge scientific and technological knowledge as traditional conflict solving in specific contexts.

Introduction

Science and technology are public property that can and should be used to increase the social welfare of the people; and solve economic, social, cultural, environmental and resource conservation at regional, national and global problems.

In Mexico, as in other Latin American countries, has not been achieved by different social sectors have a proper understanding of the structure and function of science and technology, its relevance and capacity to concur effectively not only in the growth of economies, but also on human development and resolution of problems faced by many social groups.

In this sense, the aim of this text is to propose a model of communication of science and technology to promote social appropriation and harnessing of knowledge that emerge from different communities (such as experts from various disciplines, members of organizations, entrepreneurs, politicians, journalists, researchers, students, teachers and the general public) through intercultural dialogue.

Before establishing the conditions that must permeate the intercultural dialogue is necessary to reflect on what we mean when we speak of scientific and technological culture, in principle, to the extent that the social practices of different communities and groups, whether economic, political practices social, cultural, medical, communication, recreation, sports, among others, are affected by scientific and technological practices and their outcomes. To the extent that everyday practices are dependent on appropriate scientific and technological practices on issues such as ways to address and solve certain types of problems, such as health, to make decisions and to judge them as right or wrong or inappropriate, you will be more advanced scientific and technological culture.

The promotion of a scientific culture is fundamental aspect to achieve the objectives of equality, justice and democracy in Mexican society. It is therefore necessary to establish new communication practices of science and technology, based on the development of models aimed at encourage intercultural dialogue, through which

knowledge sharing is established, giving visibility to various problems and promoting interaction of different groups in identifying common goals and building strategies aimed at improving their living.

In this context, the text is structured in three parts, the first one is focused on the description of the concept of communication. In the second part I will discuss models of science communication and the prevailing technology. And finally I will make the proposed model of communication of science and technology for a multicultural society.

What is communication?

One of the main definitions of communication is referred to its etymological root derived from Latin *communicare*, meaning "to share something, this pooling." Thus, we can understand communication as a phenomenon inherent to the relationship between living things. Here's how from communication, people will get some information about their environment and can share it with the rest.

It is understood that each individual must express and communicate very clearly what you want, so that people around him understand. Communication is the basis for any relationship between individuals, since it is the cornerstone of human behavior (Santamaría and Martínez, 2007).

Models of science communication

The first of these models is the so-called *deficit model*. According to this model, the public suffers from a lack of scientific knowledge, because of the specialization of science and the speed of their advance, so that the communicator must meet the deficit (Marcos, 2009: 122). It envisions a world bifurcated between "scientific sufficiency" and "deficiency of the public".

Thus, the deficit model is inherently asymmetrical, poses a unidirectional flow from the scientific community or to the public. On the basis of this model is the idea that it is not necessary to try to persuade the public of the need or relevance of scientific activities, but they are already persuaded, per se, the value of science (Dellamea, 1998: online).

The deficit model implies a passive receiver; thus it is expected that the emitters of scientific messages intended masses are quite effective, use of a particular rhetorical. A rhetoric that can "accommodate" the facts and methods of science, the limited experience of the public and also limited cognitive abilities of the audience. In this model, communication is then merely "cognitive", ie, only the "knowledge" are "transferred". The ethical, political, social aspects are considered irrelevant and therefore simply not addressed (Dellamea, 1998, online).

In this way the formal knowledge that scientists give to the wider society is often deeply problematic, since the transmitted scientific knowledge is partial, provisional and sometimes controversial. So, it appears that the encounter between science and the public is poor. However, it is not only necessary knowledge distribution, but must also be considered many other contextual factors (cultural, economic, institutional, political and social) that influencing the difficulties between science and the public.

From these considerations it follows the second model, called *democratic model*, in which public participation is essential, since as mentioned Simon Joss, decision making should be chosen not only by skilled professionals, political processes and policy makers, but must also participate a wider range of social actors, in this regard, representatives of non-governmental organizations, local communities, interest groups and movements of peoples (Joss, 1999: 290).

One of the first approaches to this model is definitely book entitled "The sharing of knowledge" of Philippe Roqueplo. In this paper, the author mentions that if necessary "to popularize" science would be for the purpose of "allow exercise its power in a democratic way (*dêmos*: village); for example, to allow the entire population to intervene in the choice of a nuclear policy that obviously concerns all its members" (Roqueplo, 1983: 11).

Thus, Monica Lozano explains that one of the most important differences between this model and the deficit model:

Is that the idea of science underlying these approaches is more complex: far from considering it as a field of certain knowledge and safe, it is conceived within a broader cultural dimension that coexists with other different but equally important skills. Scientific knowledge is assumed to

partial knowledge, provisional and can sometimes pose risks to the environment and to social groups, which however does not diminish its importance to understanding and solving problems in the social life of human beings human (Lozano, 2005: 42).

Similarly, John Durant, the democratic model establishes a relationship of equality between scientists and non-scientists, emphasizing the dialogue between experts and lay as a precondition for the successful resolution of disagreements. This model recognizes the existence of multiple (and sometimes contradictory) forms of expertise, and watch please everyone through constructive public debate. That is, while the deficit model formal knowledge is the key to the relationship between science and the public in the democratic model extends the range of factors, including knowledge, values, and the relationship of power and trust (Durant , 1999: 315).

In order to reach these agreements are made public meetings that allow ordinary citizens engage in the business of science and technology. This type of meeting is a dialogue between experts and citizens. Usually these meetings are made by panels of citizens, experts and a planning committee, which has overall responsibility for ensuring that all the rules of a democratic, fair and transparent process have been followed. This is done in order that both players reach a deal on resolving a problem that affects them both. This method offers a new way to give "voice to the people", which show their opinions in a more open way, and have the opportunity to influence and to structure themselves (Andersen and Jaeger, 1999: 339).

However, note that in practice they are not "pure" models. Overall communication experiences are species hybrids between these models. Also coexist in society. Pointing the existence of models that have relevance developers both political and experiences in the area can make decisions about which model is used and why it is done (Lozano, 2005: 44).

Multicultural Communications model of science and technology

In recent decades, around the world has generated awareness of the society, particularly in Latin America, is culturally diverse. Thus, the national project in each country must be developed with the participation of all cultural groups present: indigenous peoples and many other groups who identify with a culture (Velasco, 2006: 108).

Given this multicultural reality, as Leon poses Olive, political change is necessary and, in this case, developing a model of science communication that allows participation of all peoples and cultures living in each country. For this model, it is essential that journalists are able to understand and articulate the demands of different social sectors (business, including, but not limited to them, but also other social groups) and take them to the scientific and technological means to facilitate communication between them, in order to benefit the different social groups (Olive, 2008: 86-87).

Unlike the democratic model, this model is not intended to establish agreements through consensus, and the consensus that would lead us to a homogenization of cultures without respecting one of the main features of the model, respect for their traditions and knowledge of cultures. Within the multicultural model, as far from a homogeneous citizenship supports the diversity of opinions and cultures of citizens, that is, the full recognition of the right of self-determination and autonomy, participation and direct representation of indigenous peoples, protection of traditional knowledge and biological heritage as well as its tangible and intangible heritage, as mentioned in: *Los derechos de los pueblos indígenas en el marco de la Reforma del Estado, 2007*.

This model aims to find a transcendental synthesis that finally resolved in understanding others, but because in multicultural societies there are different communities with different cultural identities, as Peter Winch say; the principle of rationality is the ability to learn from others and this presupposes the understanding of meaning beyond our own culture, but it's not just a question of the proper, that brings us to an extension, not so much the consensus, as this decrease the very conditions of multiculturalism (Velasco, 2006: 147).

This multicultural model revalues and communicates both scientific and technological knowledge as traditional knowledge and sources other than knowledge of

modern systems of science and technology, as they are seriously considered part of the knowledge that can be brought into play in the processes of innovation and it deserves by both state and international agencies support for preservation, growth and implementation in the perception and identification of problems and its solution (Olivé, 2008: 76).

For the development of this model, it is also essential to take into account communication, in the sense of a social interaction, as manifested by the School of Palo Alto (approach developed half of the twentieth century). This current has an interdisciplinary view of communication, which is demonstrated by their willingness to develop a general theory of communication that could be applied in contexts as diverse as in the family system, science and technology, among other topics. The proposal of the School of Palo Alto is also known as "Orchestral Communication Model".

The Palo Alto School proposes an alternative to the linear model of communication, and work from retroactive loop model proposed by Norbert Wiener. Communication was studied, therefore, as a permanent and multidimensional process, as an integrated whole, incomprehensible without the context in which it occurs. Hence, this approach opens a way to understand the much broader communication, surpassing the previous approach and placing reflection on communication in a holistic framework as the basis of all human activity (Rizo, 2004: 12.)

In this way the multicultural model appeals to a retroactive circular pattern, in which the actions and interactions can not be understood if it is placed in context, without regard to the system or setting in which they are made or take place, taking into its original meaning: the pooling, dialogue, communion.

This plurality of cultures is valuable to this model, allowing the critical and reflective dialogue both within villages and communities, and between them, which allows the revision and enrichment of each dialogue culture, this will contribute to such groups to preserve their cultural identity and its members can exercise their freedom according to the frameworks and guidelines of their own cultural group or specific community (Velasco, 2004: 3).

On multiculturalism and, in particular, the multicultural model does not attempt to impose a knowledge of the other, but how they can coexist both scientific and technological knowledge and traditional knowledge, as each village has its own

characteristics, such as traditions, beliefs, values, norms and customs; however, the model I propose should be aware that the terms and discussions will never be like, ie, the proposed model will be used in individual and specific cases.

The model of public communication of science and technology that aims to promote intercultural dialogue, harnessing technological communication options currently available, which allow continuous dialogue, forming digital territories which promote public discussion and citizen involvement, containing a reciprocal and interactive communication between the various actors in society, because currently not enough to show the scientific and technological topics linearly where there is no place for communication of different types of knowledge that exist in the communities, ethnicities, peoples, etc. Similarly, this type of communication would work a transit information society to a knowledge society.

By way to conclusion...

As we can see, the multicultural model appeals to interactive communication among all members, ie pooling subjects relating to their context. In this regard, the commitments that must permeate as Carlos Garcia "ethos of communicators must be supported by interaction and verification of information, ie, give the actors a key role in the construction of messages."

Currently in Society Seminar Knowledge and Cultural Diversity, we are developing a portal that is responsible for communicating in the broadest sense, the uses of Patsari Stove, their practices and even what the stove users want to know other communities the communication strategy, consider not only the users, but we create a bridge with the different technicians are responsible for telling the practices and even recipes, ie not built the communication from linearity, but we train in different aspects effective communication with the "other" for example through a course on journalistic genres community communicators and they generate the message verifying data and information errors and modifying users and ultimately stay with the editors of the seminar. Note that the message is never modified, appealed to teach some communication tools for writing.

Communicating science from the multicultural model appeals to consider the wealth of groups that have traditionally been excluded and become a common tool where new actors emerge with much to innovate and more watching the wealth of a country as beautiful and rich traditions that have much to get together.

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