



Communication Efficiency in Education: Increasing Emotions and Storytelling

La eficacia comunicativa en la educación: potenciando las emociones y el relato

- Dr. Joan Ferrés is Senior Lecturer in the Department of Communication at the Pompeu Fabra University of Barcelona (Spain) (joan.ferres@upf.edu) (<http://orcid.org/0000-0001-8995-6735>)
- Dr. Maria-Jose Masanet is Researcher in the Department of Communication at the Pompeu Fabra University of Barcelona (Spain) (mjose.masanet@upf.edu) (<http://orcid.org/0000-0002-1217-9840>)

ABSTRACT

The research supporting this paper addresses the problem of educational communication efficacy using a dual methodology strategy. Over 1.200 questionnaires were given out to professionals in four institutions dedicated to persuasive communication; two traditional –the church and schools– and two more recently created – journalism and advertising. Probably they are the four groups with more socialising force in the last centuries; For this paper the educators' responses were specifically analysed to determine their conception of the communication process and the requirements for effective communication, and these were compared with those from the other groups, especially from advertising professionals. Lastly, all the responses were compared to contributions from neuroscience that have been made in recent decades about how the human mind functions, particularly with regards to decision-making, to determine which communication proposals provide a greater guarantee of efficacy. The results indicate the need for educators to break away from a strictly cognitive polarized communication that focuses on transmission. They are more related with guaranteeing the supply than creating a demand, and open up to the communicative potential of emotions, interaction and storytelling.

RESUMEN

En la investigación que da pie a estas páginas se aborda la problemática de la eficacia de la comunicación educativa mediante una doble estrategia metodológica. Se administraron más de 1.200 cuestionarios a profesionales de cuatro instituciones dedicadas a la comunicación persuasiva, dos tradicionales, la iglesia y la escuela, y dos de creación más reciente, el periodismo y la publicidad. Probablemente son los cuatro colectivos con más fuerza socializadora en los últimos siglos. Para este artículo se analizaron de manera especial las respuestas de los educadores en torno a la concepción de los procesos comunicativos y a los requisitos necesarios para la eficacia comunicativa, y se compararon con las de los demás colectivos, sobre todo con las de los profesionales de la publicidad. Finalmente se confrontaron todas estas respuestas con algunas aportaciones que se han hecho desde la neurociencia durante las últimas décadas en torno al funcionamiento de la mente humana, especialmente en relación con la toma de decisiones, para ver qué propuestas comunicativas ofrecen una mayor garantía de eficacia. Del conjunto de los resultados se desprende para los educadores la necesidad de superar una comunicación polarizada estrictamente en lo cognitivo, centrada en la transmisión, más preocupada por garantizar la oferta que por crear una demanda, y la de abrirse a las potencialidades comunicativas de la emoción, de la interacción y del storytelling.

KEYWORDS | PALABRAS CLAVE

Education, communication, cognitive, emotions, storytelling, neuroscience, interaction, advertising.
Educación, comunicación, cognitivo, emociones, storytelling, neurociencia, interacción, publicidad.



1. Introduction

The neurobiologist Giovanni Frazzetto (2014) stated that for the first time in the history of humanity we have the opportunity to know ourselves through science. This opportunity is especially useful for those communication professionals whose effectiveness depends on their ability to influence the minds of others.

However, it seems that, until now, education has not been aware of the need to take advantage of this opportunity, unlike other groups of communication professionals. When we talk about the decade of the brain, we refer to the 1990s, because it is considered that we learned more about the functioning of the human brain during this decade than in the entire previous history of humanity. Well, Neuromarketing emerged in the late 1980s before neuroscience had made its appearance. The contributions of Daniel Kahneman (2012), Nobel Prize in Economic Sciences, shattered the classical economic paradigm and led the way to Neuroeconomics and Neuromarketing (Braidot, 2005; Van-Praet, 2012). Soon new disciplines appeared that benefitted from this ground-breaking scientific knowledge about the human mind: Neuropolitics, Neuroethics, Neuropsychology, Neurosociology, etc. However, education has been slow to jump on the bandwagon. Only recently have research into and publications about Neuroeducation, Neuropedagogy and Neurodidactica began to appear (Ansari, De-Smedt, & Grabner, 2012; Bueno, 2015; Bueno, 2017; Mora, 2013; Pincham & al., 2014). Pat Wolfe (2001), however, has already affirmed that the most innovative discovery in education is neuroscience. And Leslie Hart warned that educating without knowing how the brain works is like designing a glove without ever having seen a hand (Ibarrola, 2013).

It is in this context that we must place the present research, which looks at the conceptions of communication of a group, the advertisers, that permitted to be questioned by neuroscience, and compares them with those of another group, the educators, who have lived on the outskirts of these scientific findings. Of course there are very significant differences between the communication aims and contexts of advertising and education, but they do share some concerns: they both need to overcome the indifference and reluctance of the receptors who are initially uninterested in their messages; they both aim to modify the receptors' knowledge, attitudes, values, and behaviour patterns; they both adapt their message to a defined target audience and tune it to their concerns and interests; and the effectiveness of their work is conditioned by their ability to know and manage their interlocutors' minds.

The most surprising discoveries of neuroscience have to do with the key role played by emotions and the unconscious in mental processes, including rational processes. "Emotions are the basis of everything we do, including thinking" (Maturana & Bloch, 1998: 137). "Emotions create a whirlwind of activity dedicated to one single purpose. Thoughts, unless they activate the emotional mechanisms, do not do this" (LeDoux, 1999: 337). Damasio (1996: 282): "Feeling is an integral component of the machinery of reasoning". And in another work (2000: 57): "Well directed and well deployed emotions seem to choose a support system without which the building of reason cannot operate properly".

The unconscious is also part of the great discoveries of neuroscience. Cordelia Fine (2006) calls it the secret command. "Most of the decisions we take have one responsible element: the unconscious" (Barchrach, 2013: 31), to the point that "unconscious judgments not only occur before the conscious ones, they also guide them" (Zaltman, 2003: 95).

From among the contributions of neuroscience we need to highlight the discovery of mirror neurons (Rizzolatti & Sinigaglia, 2006; Keysers, 2011) and the importance that storytelling acquires for being an effective form of persuasive communication (Ramachandran, 2011; Salmon, 2008).

2. Material and method

2.1. Objectives

The objective of the research was to determine what various groups of communication professionals understand as communication. We aimed to learn how they handle the challenge of interacting with the minds of others, what difficulties and obstacles they encounter in their communication processes and how they face them, and finally, the perception they have of their own group and the other groups of communicators. Once the most significant differences were detected, we compared them with the neuroscience findings on the functioning of the human mind in order to determine which communication proposals offer more guarantees in terms of effectiveness.

2.2. Selection of the sample

The sample universe consisted of 1.272 professionals from four different fields of persuasive communication:

533 education professionals (pre-primary, primary and secondary), 295 journalists, 225 advertising professionals and 219 priests. We used a “strategic or convenience” sampling method (Cea-D’Ancona, 1996; Igartua, 2006). The “snowball” technique was used to access the research profiles and obtain the highest possible number of answers. A reliability test was applied, and an accuracy of 2.7% was obtained.

2.3. Method and analysis

A quantitative methodology based on descriptive surveys was used. The analysis tool was a questionnaire developed by experts in the fields of communication and education. Apart from the identification questions –profession, age and community– there were multiple-choice questions, self-applied five-point Likert scales based on degrees of agreement, ratings or frequency, and open-ended questions. The answers to the open questions were analysed by experts who categorised them so they could be treated quantitatively.

For the pilot test, 37 online and face-to-face questionnaires were given to professionals from the different communication areas mentioned above. The face-to-face questionnaires were used to observe whether the professionals found the surveys too long or whether any questions were too difficult to understand, etc. The data obtained from the pilot test were treated with the SPSS program. The researchers made the appropriate changes based on the observations and results obtained.

The questionnaire was employed between 2014 and 2015 on paper and online. An application was created for the online questionnaires that automatically determined the profile and source of each questionnaire received. Once the questionnaires were given out, a database was created in the SPSS software for statistical treatment. A descriptive univariate analysis was carried out¹.

Descartes' error is the error of schools: divorcing the mind from the body, the rational from the emotional, the abstract from perception, the consciousness from the unconscious. It is logical that the renewal movements are based on increasing motivation and integration strategies, creating synergies between body and mind, abstraction and perception, reason and emotion. To influence others, it is more important to know about the minds of the people you want to influence than the contents through which you aim to influence them.

3. Results

3.1. The paradoxical relationship between educators and advertising professionals

One of the most surprising conclusions that emerged from the questionnaire responses is the paradoxical relationship between educators and advertising professionals. On the one hand, educators seem to hold them in great consideration. When the communicators were asked to rate from 1 to 5 the degree of influence they consider that educators, priests, journalists and advertisers have on what people do and the way they are and think, educators considered advertising professionals to be the most influential communicators. They gave them 4.01 points out of 5, while they gave their own group members 3.6.

In contrast, when asked to rate from 1 to 5 how much they believed they should learn from each of the groups, educators gave their own group 4.06 but gave advertisers 2.76, a score almost as low as the one they gave priests, 2.35 points.

It is surprising that they consider that advertisers are the communicators with the most influence, but they believe that we should not learn from them, or that, although they consider them more influential than their own group, they believe that we should learn more from educators than from advertisers.

There are data that help us understand this paradox. When communicators were asked “Who do you think could convince people most easily that a certain social value is good?”, almost half of the education professionals

(49.1%; n=259) responded educators, and only 38% (n=200) responded advertisers (Figure 1) (see next page).

Similar paradoxes can be found in the responses made by priests. When they were asked to rate the level of influence of the various groups on the ways of being, doing and thinking of most people, they gave the highest score (3.75 out of 5) to advertisers, and only 2.73 to their own group. However, when asked who would be able to convince people most easily that a certain social value were good, almost a third (30.9%; n=67) considered it to be their group, two points higher than advertisers (28.6%; n=62) (Figure 2).

These paradoxes in the two groups reveal some shared misunderstandings: they both equate knowledge with the ability to communicate this knowledge. They naively believe that the one who knows about a content (a value in this case) will be the one who communicates it better, and that the one who is most interested in a value will be the one who spreads this interest to other people most easily.

However, when the communicators were asked to define each group with a single word, the highest percentage of educators (17.6%; n=94) used terms related to the semantic field of manipulation (manipulators, deceivers, liars, foxes, cheats, etc.) to describe advertising professionals, almost five points above those that used concepts belonging to the semantic field of creativity (12.9%; n=69) or effectiveness (12.8%; n=68).

In summary, although educators and priests consider that advertisers are the communicators who most influence the way of being, doing and thinking of most people, they believe that they are manipulative and that, therefore, they are the least effective in transmitting a positive value. They consider that communication effectiveness depends more on the content domain than on the procedure domain; that is, it depends more on the knowledge of what is to be communicated than on the knowledge about the mind of the person to whom it is to be communicated.

In the following pages we look at these paradoxes and analyse some features of the conception educators have of communication. We then contrast them with the conception held by advertising professionals. We determined three basic communication conceptions based on transmission, cognition and supply. These differences are then compared with some recent contributions from neuroscience.

3.2. Transmission-focussed communication

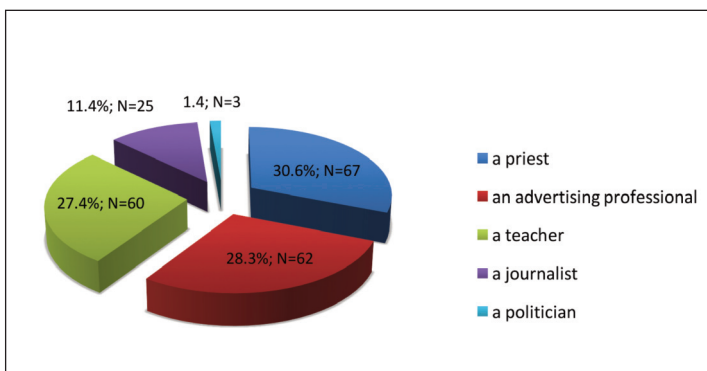


Figure 2. Importance that priests give to the different communication professionals in relation to their ability to convince people about a certain social value (lost cases: n=2).

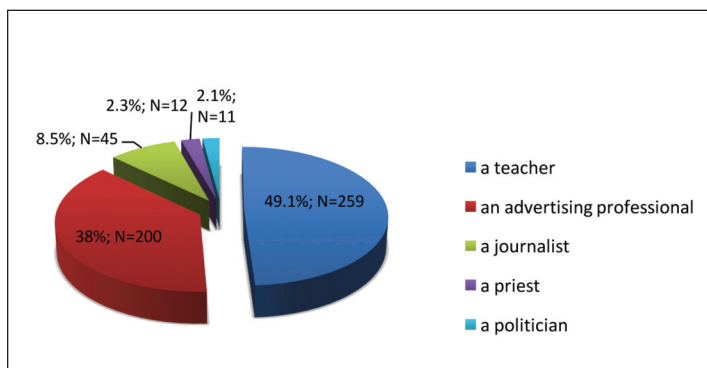


Figure 1. Importance that educators give to the different communication professionals in relation to their ability to convince people about a certain social value (lost cases: n=6).

The communicators were asked what was the main objective they wanted to achieve with their work. Far more educators expressed a unidirectional conception of the communication process (40%; n=213) than a bidirectional conception of the process (3%; n=16): "Get across as much information as possible", "Transmit information", "That the contents get to the students", "Instil contents and values", etc. The rest of the educators gave ambiguous responses (54.2%; n=289) or responded that they didn't know (2.8%; n=15).

The trend was confirmed when

they were asked to define in a maximum of two lines what they understood by communication. Among the educators who expressed themselves explicitly (84.1%; $n=448$), 56.1% ($n=299$) conceived educational communication as a unidirectional process and only 28% ($n=149$) as a bidirectional process. Most considered educational communication as a transmission process consisting in "instructing", "giving information", "sending messages", "getting contents across", etc.

The maximum expression of the transmission mentality of many educators is observed in definitions such as "Moving a message from an emitter to a receiver", "Moving information to others". Only a minority included concepts such as exchange, interaction or dialogue in their definitions.

The answers to other questions confirm that a one-way, transmission conception of communication predominates. The communication professionals were asked to order from 1 to 6 the most effective means of persuasive-educative communication. The options were face-to-face interpersonal communication, cinema, television, printed media, radio and the Internet. Almost half of the communication professionals (43.3%; $n=541$) considered face-to-face interpersonal communication to be the most effective.

Interestingly, this percentage rose in the advertising group where more than half (55%; $n=121$) considered it to be the most effective. However, the percentage fell significantly among educators: below a third (29%; $n=152$) considered it the most effective. More significant is the fact that almost the same proportion of educators (27%; $n=144$) considered it to be the least effective (Figure 3).

The communication professionals were also asked what contribution did mobile phones and the Internet have on the efficacy of persuasive communication. More than a third of advertisers, 34.2% ($n=77$), highlighted the interaction possibilities offered by these technologies, but only 10.5% ($n=56$) of educators did so. It seems, therefore, that there is a more transmission, less interactive and dialogic, mentality among educators, even though they work in face-to-face interpersonal communication, than among advertising professionals, who mainly work in mediated communication. A new paradox.

The transmission conception of educational communication increased with the education level. Among pre-primary school teachers, 52.9% ($n=36$) consider educational communication to be a two-way process; among primary school teachers 29.5% ($n=59$) considered it two-way; and among high-school teachers 20.4% ($n=54$). We can also add that the lack of sensitivity regarding the need for interaction between subjects is accompanied by a lack of sensitivity regarding the need for interaction between codes. When asked what the Internet, social networks and mobile telephones contribute to the efficacy of persuasive communication, only 3.4% of educators ($n=18$) referred to multimedia and multimodality.

3.3. Cognition-focused communication

Most education professionals understand and manage communication from strictly cognitive parameters. They focus almost exclusively on and give priority to thinking and reasoning.

Although 86.5% ($n=461$) of educators gave a definition of communication in which the effects to be achieved were not explained, 90.3% ($n=65$) of those who referred to as effects, limited themselves to the cognitive field: "Be able to make myself understood", "That the receiver grasps the meaning of what we try to transmit", "Transmit knowledge in a way that others can understand", "The extraordinary possibility of trying to explain reality to others and that they understand you", "communication is effective when the recipient is able to understand the message", etc.

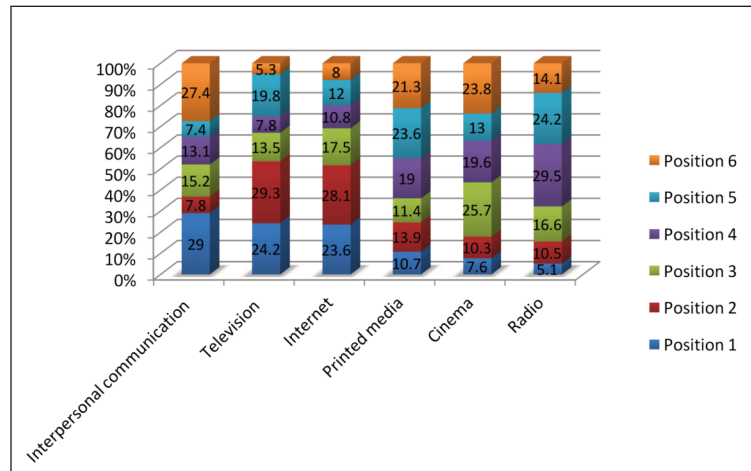


Figure 3. Order in which educators placed the media based on their communication effectiveness. 1 is maximum effectiveness and 6 is the minimum.
(Lost cases: $n=8$, except for the Internet which was $n=7$).

When asked what is the main objective of their work, 40.5% (n=216) of educators also indicated cognitive objectives: "That the students go home understanding clearly the main message that I want to transmit" "Make myself understood", "Train people who have the capacity to understand", "Get the message across objectively and clearly", "Get them to understand", etc.

If we look only at the professionals who explain the effects that communication should produce and leave out the ambiguous or unanswered cases, we obtain that while 82.4% (n=216) of educators focused exclusively on cognition, forgetting the emotional, more than half of the advertising professionals (58.8%, n=50) included the emotional factor as a priority: "Creating a feeling of needing something", "Making people feel desire", "Fascinate, make passionate" "Moving society to achieve profound changes in it", "Seduce", "Fall in love", "Modify behaviour, change lifestyles", "Transmit a persuasive message that moves one to action", "Make a product or service attractive", etc.

Among the educators who explain the effects, only 17.6% (n=46) included emotional and attitudinal objectives: "Awaken enthusiasm, interest, curiosity", "Encourage the students' desire to learn", "Motivate" "Create interest", "Awaken the need and enthusiasm to learn and to know", "To inspire my students about the subject", etc. These are suggestive responses, but they were in the minority.

3.4. Supply-focused communication

When asked what is the main obstacle to achieving their desired objective, educators gave the highest score to responses about the lack of interest and motivation of the students (26.8%; n=143), which almost doubled the score given to the communicator's lack of abilities and training (13.9%, n=74) or the unfavourable social environment (13.5%, n=72), and far surpassed other obstacles related to the saturation of information (9.4%, n=50) and the political environment (7.1%, n=38).

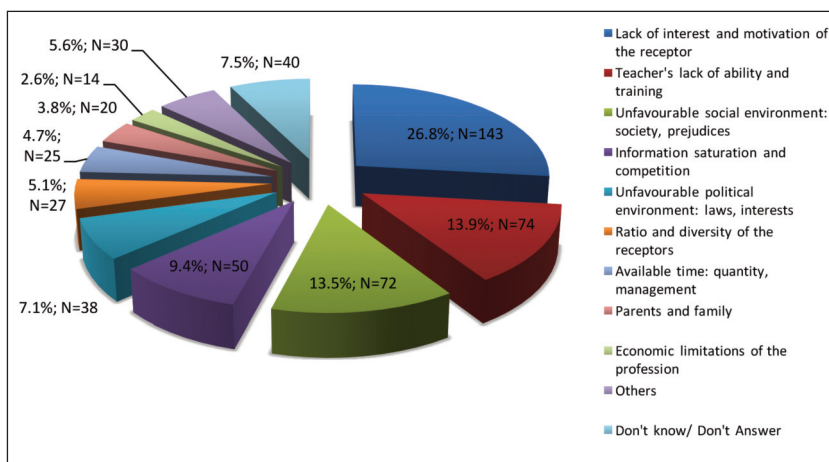


Figure 4. Obstacles that educators face in order to achieve the objectives of their communicative work.

On the other hand, among the advertising professionals, the responses that obtained the highest scores were related to information saturation (25.3%; n=57), followed by economic limitations (20.9%; n=47). Only 9.3% (n=21) referred to the interlocutors' lack of motivation.

Something similar happened when we asked about the weak points of their profession. Almost a quarter of educators (22.7%; n=121) referred to factors related to the interlocutors' lack of interest and motivation. Among the advertising professionals this was only 1.8% (n=4).

Therefore, unlike advertising professionals, educators consider that the greatest difficulties are beyond their responsibility. They do not consider the difficulty of motivating their students, of overcoming their indifference and their unresponsiveness, to be due to a deficiency in their training. We could conclude that they approach communication as if they were salespeople, rather than considering themselves advertising professionals.

A salesperson is a person who offers goods for those who want to buy them. If we were to adapt this definition to advertising, we would have to say, "a person who offers goods so that they want to buy them". The salesperson responds to a demand, while the advertising professional creates it. The salesperson can complain about the interlocutors' lack of interest. The advertising professional cannot because they are responsible for creating it.

The educators' complaints about their students' apathy demonstrate that consciously or not they act as salespeople. They do not hold themselves responsible for motivating their students ("Motivation comes from the home").

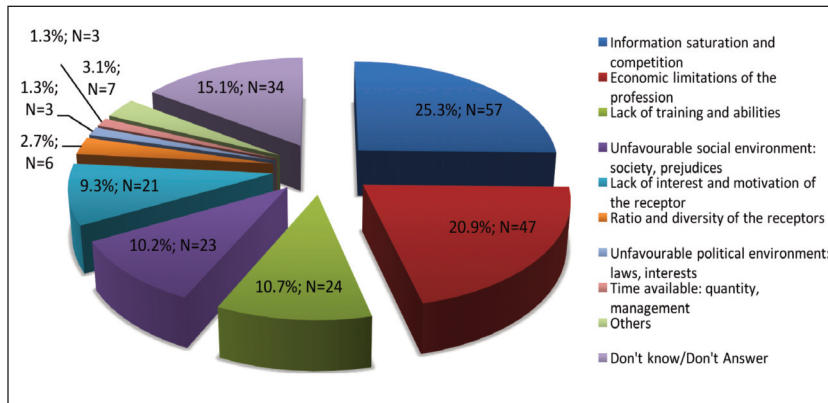


Figure 5. Obstacles that advertisers face in order to achieve the objectives of their communicative work.

In pre-primary, 17.6% (n=12) referred to the students' lack of motivation as the main obstacle to achieving their goals as communicators, in primary school it was 27% (n=54) and in secondary schools it was 29.1% (n=77). Moreover, the percentage who considered the students' lack of motivation and interest as the weak point of their profession

was 13.2% (n=9) in pre-primary, 20.5% (n=41) in primary and 26.8% (n=71) in secondary education.

The journalists showed a similar tendency to conceive communication as supply: "Inform the public about events and opinions which could interest them", "Notify the receptor of facts of interest to them", "Transmit truthful information to interested readers". The interest is taken for granted. Lorenzo Gomis does not think so. He believes journalism is the art of making what happens interesting to people. Only one journalist responded in this line: "Make readers feel inspired when they read the story in the same way that I do".

4. Discussion and conclusions

4.1. The inadequacy of the cognitive focus

Advertising professionals know that knowing about a product and understanding the messages used to promote it are essential but insufficient factors to ensure adherence and acquisition. It does not matter if a potential customer knows about Pepsi Cola and understands their advertising if what they want is a Coca Cola.

Nor is the indifference to or rejection of certain political leaders solved by making their messages more understandable. Understanding must be accompanied by the activation of an emotional response. The understood message is not powerful, rather it is the message that moves you in the right direction that is effective.

A review of the scientific literature on the mechanisms that govern mental processes calls into question an educational communication focused strictly on cognition (Serrano-Puche, 2016).

Are we afraid because we tremble or tremble because we are afraid? William James (1884) asked this question more than a hundred years ago and it is still a controversy today. From the point of view of the Cartesian paradigm, there is no doubt that we tremble because we are afraid. The response of trembling (action) would be the result of a conscious evaluation (reflection) that the rational mind makes into a response to a stimulus (perception). The mind would be like a sandwich in which perception and action would be the bread and conscious cognition the filling, the substantial element that gives meaning and flavour to the whole. Emotion and the unconscious would both be irrelevant, not to mention the body.

Damasio (1996) spoke of Descartes' error to question the Cartesian paradigm. Reason and consciousness are not the pivotal axis of mental activity. Neuroscience has arrived at this certainty by discovering that although a person with lesions to their emotional brain is still able to reason, they are unable to make appropriate decisions in terms of efficacy and ethics (Damasio, 1996).

It has also been discovered that unconscious responses occur before the conscious ones and indeed condition them. Our brain processes 11 million bits every second, but only about 40 reach the conscious level (Wilson, 2004). For centuries of evolution, the human brain has learned to manage a multiplicity of stimuli by filtering them, selecting only those that represent an opportunity or a threat. The rest are relegated to indifference, to what-do-I-care.

The only stimuli that get past the what-do-I-care are those that are associated, by genetics or learning, with a somatic marker (Damasio, 1996); those that are emotionally important for the subject (Damasio, 2005). These stimuli automatically and unconsciously elicit a body response that leads to action. In short, I'm afraid because I tremble. The unconscious body reaction occurs before we know we are afraid. The rational brain can then assess this body reaction with reasoning, but conditioned by the previous emotional reaction.

Mental processes are therefore more complex than the Cartesian paradigm explains. They are integral experiences that includes the senses, the body, emotions and cognition. The emotional (often unconscious) brain is key in selecting the few unconscious stimuli that will arrive to consciousness and the few conscious ones that will trigger action.

Communication that only considers cognition is doomed to failure because the limbic system or emotional brain "is the brain's energy source" (Carter, 2002: 54). Communication efficacy requires the capacity to manage the energy source. Educational communication is ineffective when it is saturated with thoughts that do not activate emotions and, consequently, do not motivate. In the words of Kahneman (2012: 48), "the rational brain is a secondary character who thinks it is the star". Educational communication therefore needs to rewrite its scripts to include new stars in the show.

4.2. The inadequacy of the transmission focus

Although the conventional culture invites us to think the opposite, the social and cultural hegemony of transmission technologies is a parenthesis in the history of communication. The printing press appeared in the middle of the fifteenth century, cinema in 1896, television in the 1930s. These technologies made it possible for a message to arrive simultaneously and unidirectional to a diverse and often dispersed multitude of receptors. The school emerged in this context and followed this communication model, which is far from the hegemonic parameters of the main part of human evolution.

Since the origin of the species, around 2.4 million years ago, our ancestors have lived some 84,000 generations as hunter-gatherers, only seven generations in an industrial era and only two in a digital era. Our minds are thus designed to solve the problems of hunter-gatherers (Van-Praet, 2012).

For millions of years the human brain evolved through processes of interaction with nature and with other human beings. Unlike unidirectional transmission, interaction allows us to adapt the message to the interlocutor's receptivity, their degree of interest, their capacity to understand and their learning pace. This flexibility is lost in transmission communication, especially when it is going from one to many.

In dialogic interaction with the teacher or the machine that facilitates learning, the subjects benefit from the possibility to control at all times both the motivation and interest of the interlocutors as well as their understanding and assimilation levels. In collaborative work the subjects also benefit from the possibility of learning by doing, creating synergies, looking at points of views and turning diversity into opportunity. As stated by Jenkins et al (2006) and Jenkins, Ito, and Boyd (2015), we live in a participatory culture, but schools are slow in reacting to this new reality and have not known how to take advantage of these opportunities. Change is necessary. Participatory culture requires us to move from individual expression to participation in the community.

In educational communication, the absence of interaction between subjects is often accompanied by the absence of interaction between codes. If the educator were to use multimodal communication, they would have the opportunity to use each expression form for the most appropriate contents and for the teaching functions that they best fulfil. The word is most useful for describing, the image for showing, the graph for structuring, and audio-visual communication for audio-visual-kinetic contents. The word works best for the abstract, the image and audio-visual to show and motivate, and the graph to systematize.

4.3. The inadequacy of the supply focus: the limitations of salesperson strategies

If the educator feels uncomfortable with the invitation to behave like an advertising professional and not as a salesperson, they can consider taking on the functions of a mediator. Neuromarketing expert, Neil Rackham has devoted a large part of his professional work to investigating the strategies used by the great persuasive communicators. The main conclusion of his research is that the best negotiators and mediators devote 40% of their time to determining and managing the interests of the other party (Shell & Moussa, 2007). This strategy is a far cry from the usual practice in educational communication, fixated almost exclusively on understanding.

The educator should be closer to the mediator than the salesperson. Only this relationship can lead to communication in which motivation is assumed. If a customer comes into a shop, we can assume they want to buy the product. However, the advertising professional must start the communication process taking for granted the interlocutor's indifference. And the mediator must start by taking for granted the interlocutor's opposition. The advertising professional and the mediator will not be successful if they do not generate demand, and they will fail to generate it without the ability to manage the interlocutor's emotions.

Francisco Mora (2013) states that you only learn what you love. However, according to David Bueno (2015), neuroscience shows that the expression “spare the rod and spoil the child” is correct. These two statements are not contradictory. The opposite of love for certain contents is not fear, but indifference, apathy: the what-do-I-care attitude. Love and desire are engines of action and consequently stimuli for learning, but fear can also be a stimulus. The need to free yourself from pain is a spur to action. Only indifference impedes learning.

Lack of understanding is not the main reason why some messages provoke indifference, opposition or rejection. For the educator, a lack of motivation should be more worrisome than a lack of understanding.

The apparent increase in the lack of motivation as we progress through the educational stages can be explained in this context. Going from pre-primary education to primary, and even more so in secondary education, corresponds to moving from an environment in which students have the opportunity to constantly ask about issues that concern them to another environment where they are required to continuously respond to questions they are not interested in.

4.4. The inadequacy of the supply focus: the limitations of the discourse

It should not be surprising that storytelling has become a form of hegemonic communication in all areas of persuasive communication in which it is essential to create demand: from advertising to politics, as well as leadership, economics, law, management and business. There is also evidence of the effectiveness of storytelling in the education system (Bautista, 2009).

If discourse efficacy is based on the Cartesian paradigm, then storytelling is based on the mirror neurons paradigm: neurons that don't carry out just one function, like the others, but rather several functions. It's not that they have a special configuration, but rather they have a powerful associative capacity. They connect the perceptual system with the motor system, the emotions and cognition (Keysers, 2011).

When I see (in reality or in fiction, or just when I read or hear a story) that two people kiss, in addition to activating the perceptual system, thanks to the mirror neurons, the motor system is also triggered (they activate my neurons that are activated when I kiss), as well as the emotions (I feel something similar to what I feel when I kiss) and cognition (I understand from having experienced a kiss).

It matters little that the story is fact or fiction. The mind simulates it, and consequently, makes it real, experiences it as real, involved in a unifying experience.

It is the system by which human beings have learned for 86,000 generations of hunter-gatherers. The learning experience of adolescents who accompanied adults to find food was similar to that of the child who listened to the stories of their adventures around the fire in the evening. In both cases the learning is achieved not through a discourse, which tends to activate only the rational system, but through storytelling: an integral and synergistic experience in which the perceptual, motor and emotional systems play an essential role in driving cognition.

4.5. Final thoughts

We know from science that the most appropriate metaphor for defining the mind is the network. Well, if educational communication aims to influence the mind it must adapt to the interactive demands of the network metaphor.

The educator must be able to create networks of interaction in collaborative work, in the dialogical relationship between teacher and student, the synergistic relationships between students, the integration of technological tools, the interaction between codes to create an expressive synthesis (multimedia communication), and the combination of codes to get the most out of each expression form (multimodal communication).

They also need to create interaction networks to enhance cerebral modularity. Descartes' error is the error of schools: divorcing the mind from the body, the rational from the emotional, the abstract from perception, the consciousness from the unconscious. It is logical that the renewal movements are based on increasing motivation and integration strategies, creating synergies between body and mind, abstraction and perception, reason and emotion.

To influence others, it is more important to know about the minds of the people you want to influence than the contents through which you aim to influence them.

The brain's energy centre is not the cognitive system but rather the emotional system. The greatest enemy of persuasive communication is not the difficulty of understanding but rather indifference, the “what do I care” attitude. Enhancing the emotional dimension in educational communication involves designing strategies that address the

multitude of different interests that motivate students. Ultimately, the most valuable skill of an educational communicator is their ability to motivate, to get students involved through participation and interaction.

Funding Agency

This work was funded by the R+D+i projects "Competence in audiovisual communication in a digital environment. Diagnostic of needs in three social areas" (EDU 2010-21395-C03) and "Media literacy in the emerging digital media in university environments" (EDU2015-64015-C3-2-R) of the Ministry of Economy and Competitiveness (Spain).

References

- Ansari, D., De-Smedt, B., & Grabner, R.H. (2012). Neuroeducation. A Critical Overview of an Emerging Field. *Neuroethics*, 5, 105-117. <https://doi.org/10.1007/s12152-011-9119-3>
- Bachrach, E. (2013). *ÁgilMente: aprende cómo funciona tu cerebro para potenciar tu creatividad y vivir mejor*. Barcelona: Conecta.
- Bautista, A. (2009). Relaciones interculturales en educación mediadas por narraciones audiovisuales. [Audiovisual Narrations Based on Intercultural Relationships in Education]. *Comunicar*, 33(17), 149-156. <https://doi.org/10.3916/c33-2009-03-006>
- Braidot, N.P. (2005). *Neuromarketing. Neuroeconomía y negocios*. Madrid: Puerto Norte-Sur.
- Bueno, D. (2015). La mirada de aprobación del maestro es más gratificante que un 10, *El diario.es*, 16/04/2015. (<https://goo.gl/vcXT87>) (2016-11-30).
- Bueno, D. (2017). *Neurociència per a educadors*. Barcelona: Associació de Mestres Rosa Sensat.
- Carter, R. (2002). *El nuevo mapa del cerebro*. Barcelona: RBA Libros.
- Cea-D'Ancona, M.A. (1996). *Metodología cuantitativa: estrategias y técnicas de investigación social*. Madrid: Síntesis.
- Damasio, A. (1996). *El error de Descartes. La emoción, la razón y el cerebro humano*. Barcelona: Crítica, Grijalbo Mondadori.
- Damasio, A. (2000). *Sentir lo que sucede*. Santiago de Chile: Andrés Bello.
- Damasio, A. (2005). *En busca de Spinoza. Neurobiología de la emoción y los sentimientos*. Barcelona: Crítica.
- Fine, C. (2006). *A Mind of its Own. How your Brain Distorts and Deceives*. New York: W.W. Norton & Company.
- Frazzetto, G. (2014). *Cómo sentimos. Sobre lo que la neurociencia puede y no puede decirnos acerca de nuestras emociones*. Barcelona: Anagrama.
- González, A. (2005). *Motivación académica. Teoría, aplicación y evaluación*. Madrid: Pirámide.
- Ibarrola, B. (2013). *Aprendizaje emocionante*. Madrid: SM.
- Igartua, J.J. (2006). *Métodos cuantitativos de investigación en comunicación*. Barcelona: Bosch.
- James, W. (1884). What is an Emotion? *Mind*, 9(34), 188-205. <https://doi.org/10.1093/mind/os-IX.34.188>
- Jenkins, H., Clinton, K., Purushotma, R., Robison, A., & Weigel, M. (2006). *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Chicago (IL): MacArthur Foundation.
- Jenkins, H., Ito, M., & Boyd, D. (2015). *Participatory Culture in a Networked Era: A Conversation on Youth, Learning, Commerce, and Politics*. Cambridge: Polity Books.
- Kahneman, D. (2012). *Pensar rápido, pensar despacio*. Barcelona: Debate.
- Keysers, C. (2011). *The Empathic Brain. How the Discovery of Mirror Neurons Changes our Understanding of Human Nature*. Amsterdam: Social Brain Press.
- LeDoux, J. (1999). *El cerebro emocional*. Barcelona: Ariel/Planeta.
- Maturana, H., & Bloch, S. (1998). *Biología del emocionar y Alba Emoting. Respiración y emoción*. Santiago de Chile: Dolmen.
- Mora, F. (2013). *Neuroeducación. Solo se aprende aquello que se ama*. Madrid: Alianza.
- Pincham, H.L., Matejko, A., Obersteiner, A., Killikelly, C., Abraham, K.P., Benavides-Varela, S. ..., Vuillier, L. (2014). Forging a New Path for Educational Neuroscience: An international Young-Researcher Perspective on Combining Neuroscience and Educational Practices. *Trends in Neuroscience and Education*, 3, 28-31. <https://doi.org/10.1016/j.tine.2014.02.002>
- Ramachandran, V.S. (2011). *The Tell-Tale Brain*. New York: W.W. Norton & Company
- Rizzolatti, G., & Sinigaglia, C. (2006). *Las neuronas espejo. Los mecanismos de la empatía emocional*. Barcelona: Paidós.
- Salmon, C.R. (2008). *Storytelling. La máquina de fabricar historias y formatear las mentes*. Barcelona: Península.
- Serrano-Puche, J. (2016). Internet y emociones: nuevas tendencias en un campo de investigación emergente. [Internet and Emotions: New Trends in an Emerging Field of Research]. *Comunicar*, 46(24), 19-26. <https://doi.org/10.3916/C46-2016-02>
- Shell, R.G., & Moussa, M. (2007). *The Art of Woo: Using Strategic Persuasion to Sell Your Ideas*. New York: Portfolio.
- Van-Praet, D. (2012). *Unconscious Branding. How Neuroscience can Empower (and Inspire) Marketing*. New York: Palgrave MacMillan.
- Wilson, T. D. (2002). *Strangers to Ourselves: Discovering the Adaptive Unconscious*. United States: Harvard University Press.
- Wolfe, P. (2009). Brain Research and Education: Fad or Foundation? *LOEX Conference Proceedings 2007*, 38. (<http://bit.ly/2nsnrFd>) (2017-03-27).
- Zaltman, G. (2004). *Cómo piensan los consumidores. Lo que nuestros clientes no pueden decirnos y nuestros competidores no saben*. Barcelona: Urano.