

REFLEXIVES[®] AS TRANSACTION SPACES FOR IMPROVED COMMUNICATION AMONG DISCIPLINES AND BETWEEN SCIENTISTS AND SOCIETY

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ABSTRACT

Communicating *is* the doing of science. Scientists need new skills, and must develop the ability to be self-reflective in order to move from a linear model of “public understanding of science” to a “democratic” model where they share with non-experts societal and scientific problems.

Working on the formulation of research questions is one way to improve scientists’ communication skills, to encourage them to be reflective practitioners and to prepare them to be mediators in the processes of communicating science. Réflexives[®] are spaces of systemic communication and mediation, facilitated by researchers who conduct creativity workshops. Linguistic skills are developed in writing workshops. Projects and practices are debated, using epistemology-in-practice, reflective practice, dialogue and real work situations. Researchers are expected to be better writers and speakers and to be better able to link across the cultural differences existing between partners involved in a research process. The quality of research should therefore be improved.

INDEX TERMS (5) reflective practice, epistemology-in-practice, project building, linguistics, mediation

INTRODUCTION

“A humane collective life depends on vulnerable forms of innovation-bearing, reciprocal and unforcedly egalitarian everyday communication” says the philosopher Jurgen Habermas. This is precisely what we, at INRA (French National Institute for Agricultural Research) aim at – creating some “ideal speech situations” to enhance mutual understanding and a humane collective life. The issue raised by this Conference, of how to engage scientists and the science community in communicating science and technology can then be addressed by training scientists to be more effective “writers and speakers” : the answer may sound obvious and simple and yet we will show that it is not . To achieve this objective does not only require recommendations and technical solutions in the form of manuals – which are plenty- or technical training by specialists. To us it means working on the formulation of research projects and enhancing researchers’ communication towards their peers and society, and communication among disciplines. It means training future researchers – PhD students and postdocs - into becoming professionals with strong communication skills with the capacity to be both knowledge producers and knowledge communicators.

Communicating *is* the doing of science. “Science exists because scientists are writers and speakers. We know this, if only intuitively, from the very moment we embark upon a career in biology, physics, or geology. As a form of knowledge, scientific understanding is inseparable from the written and the spoken word. There are no boundaries, no walls, between the doing of science and the communication of it; communicating *is* the doing of science.” (Montgomery 2003). Most writing manuals start with a similar assumption. But what does “being more effective writers and speakers” mean? One major reason why papers are rejected is that introductions are weak and discussions rambling – which proves that researchers very often fail to properly justify their research and see the interest of their work. Yet these

qualities are key to develop mutual understanding. Clearly, the issue is about changing practices.

Indeed, science communication plays a fundamental role in innovation processes and we are moving away from a linear model of “public understanding of science” – science being explained to the public by mediators (journalists or other communication specialists) – towards a “democratic” model (Durant 2000, cited by Gristock 2000) in which an open dialogue and consensus building between scientists and non-scientists must develop and more open and interactive settings where people can meet and question science are imagined. In “The Production of New Knowledge” (1992), Gibbons et al. insisted that in Mode 2 of knowledge production, knowledge was distributed, contextualized and heterogeneous, that “the agora is where today’s societal and scientific problems are framed and defined and their solutions negotiated”, and that reflexivity is therefore much needed to incorporate future potential implications into the research process from the beginning and produce “socially robust knowledge”. More recently, Israel and her colleagues have provided a definition and rationale for community-based participatory research (CBPR): “CBPR is a collaborative partnership approach to research that equitably involves for example, community members, organizational representatives, and researchers in all aspects of the research process. Partners contribute their expertise and share responsibilities and ownership to increase understanding of a given phenomenon, and incorporate the knowledge gained with action to enhance the health and well being of community members.” (Israel et al, 1998). In order to be able to share their research questions with other scientists and with non-experts, scientists need “new skills in communication, (...) the ability to be self-reflective and admit mistakes, capacity to work within different power structures, and humility”. The authors go as far as saying that “doctoral training is particularly important in that it is often easier for researchers to learn this approach initially than having to unlearn another perspective”.

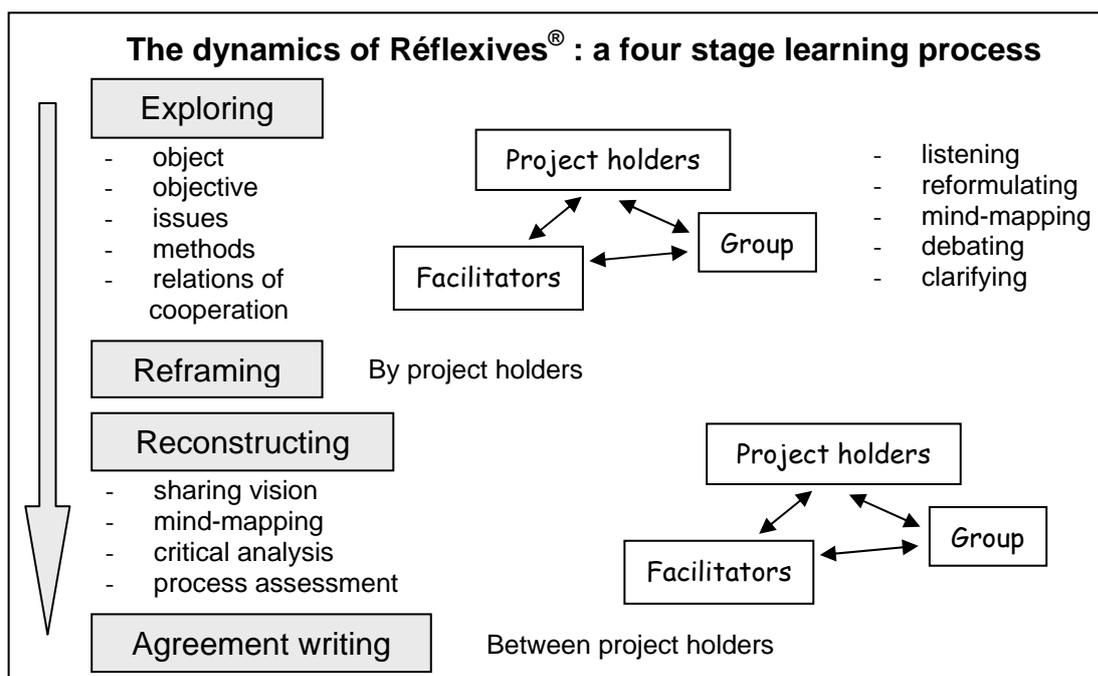
The obstacles to effective communication indeed are many within the scientific community and with the public: within the scientific community, first and foremost the evaluation system based on disciplinary achievements and the blind competition among and within research teams. Second the hyper-specialization and technical efficiency which have been the current norms for the past decades, so that research activity has tended to be technique-oriented and researchers have become more and more preoccupied with the “hows” than with the “whys” of their research. Funding bodies both at the European level and in North America have observed the same weaknesses in the projects they evaluate; the weaknesses concern the formulation of research questions, of hypotheses and of research strategy and point to difficulties researchers encounter, moving from an idea to a research project and formulating their research questions. Finally, weaknesses and gaps in the training of researchers, which must be underlined. Briefly, too little attention is still paid to the key stage in the training of young investigators, i.e the stage when they must move away from ‘accumulating knowledge’ to “producing knowledge” (Gaudin 1998). As for communication with society, difficulties arise when it comes to translating a societal problem into a research problem, and then having non-experts – journalists for example- take ownership of research questions elaborated by scientists.

Thus, our hypothesis is that working on the elaboration of research questions and research projects is one way to improve scientists’ communication skills, to encourage them to be reflective practitioners and to prepare them to be mediators in the processes of communicating science within the scientific community and within society. (Roland 1995). To achieve this objective and thus contribute to improve connectedness and reweave the social fabric in research, we have created new spaces for social interactions based on epistemology-in-practice, reflective practice, dialogue and real work situations.

THE SCIENCE COMMUNICATION PROCESS

1. Réflexives®, spaces of systemic communication and mediation

The system comprises different objects or actors - all of them researchers: PhD students, supervisors, early-stage researchers, facilitators. All share a common goal: to generate questions on and enhance comprehension of the objectives, issues, methods and tools used in producing knowledge in the framework of a research project. They share a common understanding of the process itself, conducted by the two facilitators in the respect of codified exchanges: heuristic questioning, use of a common tool and method -mind mapping (Buzan 1993, and other intermediary objects. Homeostasis of the system is reached taking into account paradoxical situations, issues, rules and benefits. The spaces Réflexives® are spaces where projects and relations can be reframed: components of the exchanges can be re-arranged both at the content and at the relation levels, cooperation between the stakeholders is enhanced. A typical Réflexives® seminar comprises both creativity workshops and writing workshops in order to link oral and writing activities: linguistics analysis of constructions reveals the semantic and logical components and combinations of reasoning. Writing workshops come as a reinforcement of creativity workshops with critical reading and analysis. The process itself is made up of four main stages (Fig.1): (i) exploration, where the group explores with the project holders the object, objectives, issues, methods of the research as well as cooperation among the group : participants indeed initiate a personal developmental process involving the whole person, relating past and present, and realize they are intrinsically tied to others as social beings, thus enhancing their capacity to fathom and appreciate human differences and to create opportunities for creative cooperations; (ii) reframing, where the project holders are invited to reflect on the first stage of the process in terms of their objectives and their relation of cooperation, explore both further and reconstruct their project; (iii) reconstruction, where the project holders propose the “new” version of their project to critical analysis by the group. (iv) final reframing and agreement writing, where project holders write the abstract of a project, which materializes the link negotiated between them and brings the process to a conclusion. In the process, mediation fully plays its role, triggering exploration, mutual recognition and cooperation in the elaboration of a common project aimed at producing new knowledge and answering social demand.



2. In situ implementation :

creating a learning environment: learning is fundamentally about making and maintaining connections: mentally among concepts, ideas and meanings; experientially through interactions between the mind and the environment, self and other, generality and context, deliberation and action. To maintain connections, appropriate learning experiences and environments must be created ; participants must be exposed to alternative world views and culturally diverse perspectives, and engage into an active search for meaning, constructing knowledge rather than passively receiving it, shaping as well as being shaped by experiences, seeking meaning in the context of ethical values and commitments. The individual and social nature of learning has the potential for creating powerful learning environments.

But learning will not emerge spontaneously. When people get together in groups they will most likely fall unconsciously into familiar patterns of behaviour. Power dynamics, gender issues, cultural differences, strong emotions, even routine procedures can diminish a group's capacity to respond creatively to a complex issue. So, how do we create the conditions which will encourage participants to engage in social learning? A strategy of dialogue must be developed to give participants an equal chance to participate, to achieve reciprocity and symmetry.

skilled facilitators are needed: mediation and facilitation play a fundamental role in developing these forms of collective action. They help design types of action and activities to overcome relations of interest and power. Réflexives[®] skilled facilitators can help surface and challenge assumptions appropriately in the interest of deeper levels of learning. First they are independent from the research work considered and have no interest in the questions debated. They have no power, no hierarchical links with the group; their only authority is the authority the group acknowledges in the way they conduct the process. Independence, neutrality and ability to conduct the process are key to the success of the work. This is one reason why each group is facilitated by two researchers. We have imagined activities and a way of questioning that stimulate comparisons and associations, explore relationships, activities that foster evaluation of alternative perspectives and solutions; we also challenge participants to draw conclusions from evidence. Participants thus find a wealth of opportunities to relate their own experience and knowledge to materials being learned, to integrate ideas and themes within and across fields of knowledge and establish coherence among learning experiences within and beyond the events.

beyond implicit and jargon : Habermas (1984) defines what he calls an "ideal speech situation" as a situation where each participant has an effective equality of chances to take part in dialogue, where asymmetry is limited, where dialogue is unconstrained and not distorted. In the scientific community, communication is hindered by the extreme specialization of research activities, and particularly by the fact that researchers "learn their trade" in the laboratory and that much of the knowledge and know how, which are transmitted and acquired through a process of socialization remain tacit and implicit. Jargon also obstructs clarity and threatens quality, thus contributing to those distortions which hamper dialogue. In Réflexives[®], surrounded by colleagues from various disciplines or lay persons, placed at the centre of the debate, the researcher is forced to formulate what usually remains tacit: his research problem, question and strategy, etc. Concepts and terminology are debated and clarified, researchers are encouraged to produce informative rather than descriptive statements. Going through these intellectual activities, researchers question their own discourse, its relevance, the relevance of the knowledge and know how they are producing and transmitting. The process requires reflection on one's own work and choices and requires one also to assume a well defined point of view (Darré, 1999). It is certainly difficult and costly in terms of self-image and authority but researchers gain in objectivity and their capacity to convince.

group composition and size : we usually have 8 researchers (or 4 student/supervisors pairs in the case of PhD projects) and two facilitators working together. The relations within the group are non-hierarchical – both at the institutional and disciplinary levels: facilitators and participants come from several disciplinary backgrounds so that multi-disciplinary points of view are brought in the debate and that project holders are naturally obliged to discuss not the technical aspects of their research but the issues and objectives. The facilitators are researchers who have received a special training: first they have taken part in Réflexives[®] sessions as participants and experienced debating their own work; then after acquiring facilitation techniques, they regularly meet to share experience, discuss facilitation strategies and methods as well as analyse the impact of Réflexives[®] on researchers' training.

EVALUATION

For institutional reasons mainly, only indirect evaluation has been conducted so far. The following “indicators” are available : (i) almost all participants pursue the training and learning process by attending “writing labs” which are organized specially for them. (ii) young researchers are more and more interested into becoming facilitators and a facilitation training programme has been designed in order to answer the demand. (iii) certificates of attendance are given to participants: doctoral schools accept them, showing that those new pedagogical spaces are of interest to Universities.

Presently assessment schemes are being developed to emphasize the learning continuum: Réflexives[®] will soon be implemented via a European project funded in the 6th Framework Program : an assessment scheme is being built into the learning process , based on a participatory evaluation approach – i.e participation will occur throughout the evaluation process from identifying the relevant questions, to planning the evaluation design and gathering and analysing data. Second, we are developing another assessment scheme via reflective analysis . Finally, the seminars will be a research object in three projects (i) ethnographers and anthropologists will study how knowledge is transmitted (ii) researchers in work psychology will study researchers' relations to their activity (iii) ergonomists will study how "intermediary objects / mediator objects "are used and what their purpose is during the seminars. The knowledge produced will give us feedback on practices at different levels.

DISCUSSION

How sustainable is such a process?

We designed the process with a “quality feedback loop” involving both supervisors and PhD students and post-docs who, in turn will become supervisors. We thus expect younger generations of researchers to become conscious of the benefits involved: (i) gaining a scientific identity, (ii) being better supervisors, (iii) being more competent, with increased capacity to conceptualize and see the “big picture” and to understand the implications of their work. At stake is clearly a change in practices. This is also why it is so important to work in “real work situations” and use reflexivity.

Recruiting and training facilitators in research environments

It has indeed become obvious that facilitation and mediation are essential to ensure the success of the new types of collective action; thus facilitators with proven skills and experience must be trained. Their role must not be confused with that of experts: experts often referred to as “key speakers” usually make presentations within the groups to bring in information; therefore they are identified as “those who know” by the group. Very often, it is difficult for them to listen, to accept different viewpoints, and they will also tend to adopt a dominating position. Conversely, participants will feel “inferior”, being “those who don't know” and frustration will mount. The challenge then is to combine “intellectual stimulation and emotional regulation”. Another limit lies in the lack of recognition awarded for this work

from the side of universities, making it difficult to mobilize researchers to engage in such processes.

What are the conditions for such transaction spaces to exist within and between institutions?

Although many experts are asking for the creation of “spaces of transaction” (Nowotny et al, 2001) or new “pedagogical spaces” (Godelier and Bourgeois, 2003), such spaces seem very difficult to create within the scientific community. At INRA, we have the institutional structure involved in the process – heads of departments have always supported the project and they do have feedback through collective reporting- ; they may have specific selection procedures to send researchers to the seminars or just encourage them to go, but it usually stops there. We insist on keeping hierarchical pressure low. A climate of trust must be created and good communication is key to the process. The challenge clearly is to link these spaces to usual power structures.

CONCLUSION

Forums and consultations are developing, new spaces of collective action and transaction are needed to reweave social bonding and address global problems. Researchers are more and more involved in such participatory processes and must develop new communication skills. The seminars Réflexives[®] are used to train researchers and doctoral students to be better knowledge producers and communicators; they are used also to construct scientific projects at different levels: PhD student and supervisor pair, research teams, consortia. Their design and methodology can be used, especially in terms of communication, mediation and facilitation with mixed groups of researchers and non-experts to lead to mutual understanding and innovative solutions.

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