□ Work system design
□ Designer
□ User
□ Communication
□ Methodology

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ASSOCIATIVE IMAGES AS A COMMUNICATION TOOL TO IMPROVE THE DIALOGUE BETWEEN DESIGNERS AND END-USERS

In this paper we describe a communication tool able to support a dialogue between designers and users. We also present our reflections about what our experiments with various dialogues in participative design have taught us about the shortcomings of verbal dialogue, and what happens when using alternative means - words and pictures - when communicating. This tool is a means by which the construction of a design dialogue can be undertaken. The particularity of this dialogue is that the communication media used by the participants is a combination of associative pictures and verbal language. We argue that verbal dialogue alone is unreliable and has to be complemented by other media. Also, we discuss the possibilities revealed by experiments that pictures catch people's imagination and that they can be used as representations for future ideas. Language and imagery are investigated in the paper, a theoretical approach is presented and arguments are developed to explain our procedure. Using a dialogue with imagery has also made us rethink about when a planning and design process actually starts. If we intend to change basic habits, we must start earlier than we normally do by deconstructing our concepts and reconstruct them together in the specific situation.

The paper contributes to the discussion on two issues investigated during the 9th international symposium of the ISSA Research Section on design process and human factors integration (Nice, France, 1-3 March 2006): "participative design" and "design practices - *how to build bridges between designers and end-users*". This contribution is our experience from research experiments involving the end-users in changes affecting their own environment. It is one in a long row of such experiments in the Scandinavian tradition of inviting citizens to voice their opinions about major changes in the built environment, in residential areas (Olivegren 1975), at workplaces (Ahlin 1974; Steen and Ullmark 1982; Granath 1991) or in public spaces in the urban landscape (Birgersson 1996).

Participation and dialogue are common concepts in different discourses, for example, in politics, management, design and planning. They refer to slightly different ways of involving people and are used in different situations and contexts. We are related to the specialist field of architecture and town planning, and within this broad practice we are

involved in the design and planning of workplaces. Our research tradition, which has developed in closed connection with town planning and design projects, has been focused on improving existing or creating new workplaces.

Our field of research is the dialogue between participants with different backgrounds, professions, knowledge, etc., involved in a change process. It is based on a long research tradition at the School of Architecture, Chalmers University of Technology, in Göteborg, Sweden, formed by a number of researchers interested in workplace design, user participation in design processes, as well as the development of entrepreneurship in connection with urban regeneration. This research tradition thus started in the spirit of the 1970s with the idea of supporting the *rights* of the employees *to argue and be heard* in matters affecting their working environment.

During the 1980s and 90s, researchers from this unit had several opportunities to participate in processes involving changes initiated by large and semi-large companies such as Volvo, SKF, Ericsson, Bil & Truck or local authorities. During these two decades, the researchers encountered many different problems and successively tried out different dialogues and, through reflection tried to understand design and participation (Sachs, Granath et al. 1981; Granath 1991; Birgersson 1996; Lindahl 2001; Rehal 2004).

Knowledge within architecture and in particular within the design of workplaces is embedded in specific situations and as a rule should not be generalised. Therefore, we have turned our interest towards knowledge about the process of finding good solutions for specific situations. From this standpoint, we have questioned generalised expert knowledge and look upon design as a shared process involving a range of competences from different disciplines and different practices in a given situation. From this perspective, communication involving the end-users is also problematic.

THE PROBLEMATIC OF USER PARTICIPATION

The objectives of the 9th international symposium of the ISSA Research Section, as stated in the schedule, were *"to look beyond the technical dimension dictated by an engineering-driven approach that focuses on the technical design and control of production sys-*

FIGURE 1

The asymmetrical communication within the design process
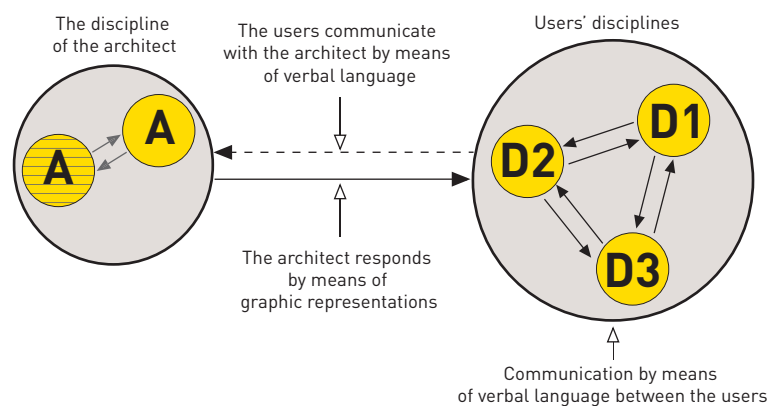
tems, with little consideration given to the users". In Scandinavia the engineering approach concerning the design of workplaces has been questioned since the 1970s, and this questioning opened the door to the field of workplace design for the architectural profession (Etzler 1991).

During the 1970s, in highly-developed countries, expert-oriented knowledge was severely criticised (Broadbent 1984). Even in the public debate, society was considered to be steered too much by the experts (Brante 1987). Experts were not often aware of the reality of the end-users resulting in negative consequences regarding the final product. Thus, it was generally recognised that the involvement of the users in design processes could be the solution to problems caused by the traditional process of design by a team of experts.

Aiming at a dialogue is one thing and the way dialogue is carried out is another. Indeed, a dialogue can be structured and carried on in many different manners. The dialogue may be a discussion around the architect's sketches or a range of questions posed by the expert and answered by the users. It could also be conducted as an inquiry or as an interview conceived and directed by the specialist in order to collect information about the users reality - their needs, wills, representations etc.... All these kinds of dialogues have been and still are used by experts in order to establish communication with the end-users, the goal being of course a well-designed product at the end of the process.

We believe that the dialogue is the foundation in participation and has a broader meaning than just being a means of producing a good artefact. It is a practice that can constantly be developed within an organisation. Participation involves a dialogue between people with different backgrounds, skills, professions, etc. acting together in order to change an existing situation into a better one. The dialogue is then an arena where different views, visions, representations and languages meet. It is in itself a process of design. It is in this dialogue that society and social realities are constructed and transformed. To understand the mechanisms that constitute such a dialogue in design is the main purpose of this paper.

Our experience regarding user participation in workplaces has taught us that dialogue in design processes involving users has several problems to deal with. A dialogue between experts and users encounters communication barriers due to their different knowledge and rank. In addition, in matters concerning design and planning, it is also problematic that different means of communication are used. In this respect, the dialogue is asymmetrical; the users express themselves verbally, while the architect /planner responds graphically with draft sketches, plans, etc. Furthermore, the users do not constitute a homogenous group. They have different backgrounds, professions, knowledge, and sometimes different cultures. Consequently, the situation of change is characterised by a mixture of perspectives of the world.

Sometimes architects and researchers start a development process by listening to what the users have to say about the planned transformation of their environment. Often as a quick response to the users, the architects' drawings and the planners' plans are introduced. It is noticeable when this happens that these graphic representations have a hampering effect on the ability of the users to develop their own representations. They also tend to regard them as fixed solu-

tions, even if they are still intended as mere sketches. From this point onwards the users' reflections about the situation tend to be framed by the sketch and become mainly concerned about variants of the solution presented or its details (Ullmark and Granath 1995).

Also, we have to take into consideration the fact that the users mostly do not have well thought-out ideas about how they would like to change their environment and seldom get the opportunity to really reflect about their situation when changes in their environment are about to be initiated. In most cases, the design process is conducted by an expert who gathers knowledge in verbal form via questionnaires or interviews, or the reactions from a drawing or plan, about the users' experiences, desires, needs and visions. The expert is expected to be the right actor to be able to translate verbal demands into spatial configurations. Furthermore, if the users are only expected to answer questions, without having the time or the means to reflect about their situation, or the possibility to confront their views with other users, then their imagination will be somewhat constricted. It will be difficult for them to conjure up solutions for their problems outside the limits of what they are already able to directly express.

Another problem is the unreflecting use of a common language. We tend to believe that we can communicate on almost everything with anyone with help of everyday language. We are not really aware of ambiguities intrinsic in the language. Language is not merely a channel through which information about underlying mental states and behaviour or facts about the world are communicated. It also shapes our social world, our world-view (Winther Jørgensen and Phillips 2002). The phenomenon of language will be examined later on in this paper.

CONCEPTO, A TOOL FOR DIALOGUE BASED ON A COMBINATION OF IMAGERY AND VERBAL UTTERANCE

To avoid the difficulties described above a communication tool, Concepto, has been elaborated from a set of experiments that simulate the dialogue in the

FIGURE 2

The first stage. Each participant looks for 3 or 4 pictures to associate to some concepts (self-dialogue)

FIGURE 3

The presentation of the images during the first stage

FIGURE 4

The second and third stage. The dialogue proceeds to achieve a common understanding (dialogue with others)

initial phase of the design process (Rehal 1997; Rehal 1998; Granath 2005). Experiments were conducted using printed pictures to facilitate the users' ability to articulate them. The pictures are in this situation used associatively, which means that the blocking effect caused by graphic representations does not occur.

Concepto is merely a dialogue-based method in which pictures are associated to key concepts that catch the situation of change. It consists of a picture database with the support of a trained facilitator. The images that constitute the tool are photographs illustrating common situations,

things and phenomena. A large part of the picture collection is made of photographs that we, or our colleagues, have taken. The rest has been bought in from commercial picture databases.

To carry out a dialogue according to the Concepto method, one needs a facilitator – a person who can conduct the dialogue through the different stages and support the participants. The dialogue basically contains two situations involving reflection. The individual one, which occurs when each participant selects pictures to which they associate concepts related to problems or possibilities involved in the

proposed situation of change. The common one, in which the participants develop a common understanding that can be a basis for further development work. If there are many participants involved, or if they are from different disciplines or have different backgrounds, then it is preferable to start the common reflection with subgroups, gathering people with the same background or knowledge. In this case the dialogue will be carried out in three stages. A first stage for the individual choice of pictures. A second stage for a discussion within the subgroups, where a common understanding is developed and illustrated with images. A third stage in which a new dialogue is initiated to develop a broader common understanding between all the participants, based on the contributions from each subgroup.

The first thing to do in order to start a Concepto dialogue is to formulate the questions that embrace pertinent aspects of the actual design situation and that will involve relevant concepts to discuss. Once the questions are formulated and the groups constituted, the participants have to look through Concepto's picture collection to relate images to the key concepts. *This individual reflection* is the first stage – the self-dialogue - in the Concepto communication tool.

The next step in the first stage is the presentation of the individual selection of pictures. Here the participants display their images on a wall so that the whole group can see them. The participants present their images individually and motivate them.

The second stage begins when all individuals have presented their images to the other participants within the subgroup. A *dialogue with others* starts. This *common reflection* consists on a free discussion around the images within each subgroup.

The third stage proceeds like the second with the difference that it is the subgroups' contributions that are discussed, not the individual ones. It is also a common reflection, but in the form of an *interdisciplinary dialogue.*

The basic hypothesis is that the associative use of pictures (images) enriches communication and supports participants to better express that which is tacit, implicit or difficult to articulate verbally. The tool has to fulfil two major conditions. The first one is that it must be used from the very beginning, before the designer makes any proposal. The second condition is that the use of verbal language, as we use it in everyday communication, must be reconsidered,

because it is unreliable and cannot be used straight off in the dialogue within a design process. In our research we choose to complement verbal language with imagery without disowning the fact that other media can be foreseeable. We do not use images because, as the well-*known maxim affirms, "the image tells more than a thousand words"*, which is partially a false statement, but rather because *"the words too tell more than a thousand pictures".*

SOME EXAMPLES

During our research, we witnessed situations all the time where a participant associated a concept to an image that surprised the other participants in the dialogue process. Let us take as an example, the concept of *flexibility*. The number of pictures that can be associated to this can only be limited by the imagination of the participant. In one of our experiments, one participant chose a picture of a woman mountaineer struggling on a sheer rock face, to illustrate what she (the participant) had earlier verbally expressed as *a need for flexibility in her workplace*. The word *flexibility* can in this case be misleading for the architect who only takes into account the participant's verbal expression. The architect will interpret flexibility as something that deals with spatial configuration. The word *flexibility* refers to different things in the architect's world of concept, than it does for a user talking about his or her work situation. In our example, the lady who took up flexibility in the discussion commented her picture with some laconic expressions: *"barriers are there to be overcome", "one can lose the grip", "people are flexible..."* (Rehal 1997).


Another example is the concept of bad air, formulated verbally by participants to describe their work environment. This was interpreted by the interviewer as "the bad quality of the physical air" in the building. When the partici-

pants were asked to show pictures that illustrate what they mean by *bad air*, they chose pictures that show what *bad air* is not. They explained that *bad air* is the absence of openness. Feeling the seasons, the weather and the colours of nature, that is what they are missing in their workplace. Their pictures were photographs illustrating open landscapes and oasis (ibid.).

We also experienced a situation in which concepts were given different contents by different professions. This happened in an experiment conducted with students and staff during the preparation of the design of a multimedia centre at the university.

The three people with physicist backgrounds that were going to work in the centre represented the clients in the design situation, as well as the future users with similar backgrounds. The students in the experiment were from the Chalmers University of Technology and represented the future users of the multimedia centre, but also designers involved in such a design task. Both groups agreed that *multimedia* and *communication* were the key concepts that had to be investigated in order to develop a good vision of the future multimedia centre. These concepts are widely used. At the time of the experiment, we did not realise that these concepts could mean such different things for different groups of people, and that misunderstandings of a whole design concept might occur. The experiment
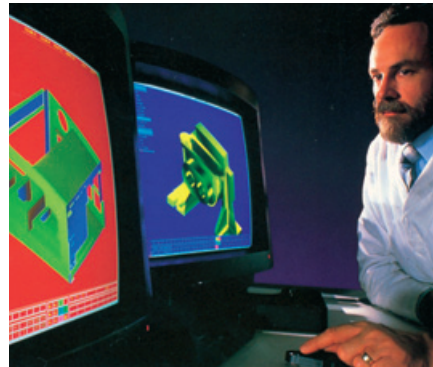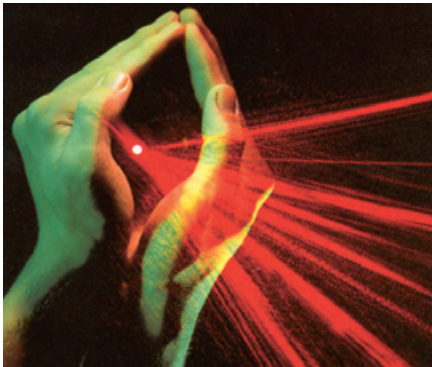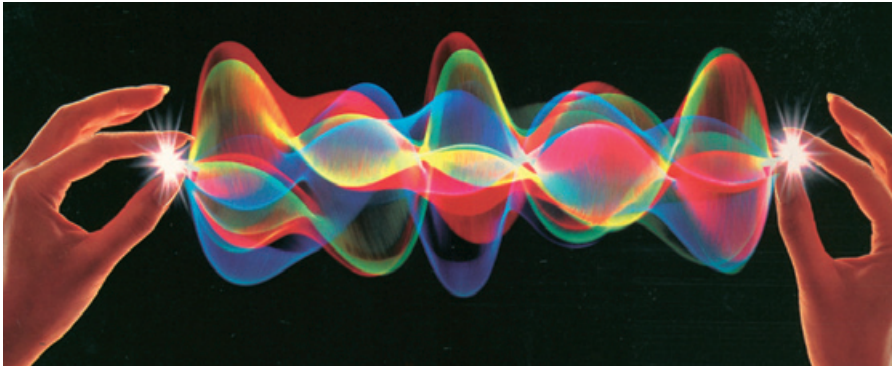
showed this might be the case.

For the physicist staff, the multimedia concept was firmly associated with data processing and the computer. Most pictures chosen by the staff showed computers or pictures of phenomena simulated by the computer, or pictures processed by a computer.

The student architects, on the other hand, do not have any picture associated with data processing. Their pictures mostly illustrate human activities, such as work, games, leisure and human contact.

During the interdisciplinary dialogue, the two groups, while confronting their respective pictures, became aware of what the 'multimedia' concept really represents for each group. This experience confirms that the concept of multimedia is a diffuse one. For the staff of the library, with physicist backgrounds, the computer and data processing provides the opportunity for the physicist to visualise physical phenomena that up to now can only be represented by a mathematical language. For the student architects, visualisation is an obvious part of their profession, as they work with images all the time. From their point of view, 'multimedia' seems to stand for human communication in its various forms. The images together with the discussion narrowed the gap between the views of the participants. The library manager said at the end of the experiment, *"we're talking the same language...*

of course multimedia isn't only computers... we have to take advantage of new technology without losing the human contacts, ...". An architectural student said after the experiment, *"It's incredible... just write a formula on the keyboard, and you can see it on the screen".*

Finally this experiment made it possible for both groups to exchange their points of view and to be aware of the limits of their own way of representing the world.

The use of images with an associative character as a complement to the common language surmounts the difficulties of communication due to the language barriers between the various disciplines involved in the process. A method using pictures in the early stages of a design process has turned out to give the participants an opportunity to reflect about and articulate pre-conceptual ideas, firstly for themselves, secondly for each other in order to develop a common understanding and vision. A number of experiments showed that this method does not only resolve the interdisciplinary communications problem, but also stimulates reflection at the level of the single actor. By seeking a suitable image, the actor releases himself from the verbal framing of a concept and better apprehends what he/she tries to express.

By introducing pictures, around which the participants associate the problems and possibilities involved in the changes they are facing, we have observed that the users acquire an instrument that allows them to *reflect with the situation* (Schön 1983). This is rather like what the designer and architect do when sketching to find the form for a new structure, the new artefacts to be built. Using such a dialogue that allows everyone to ventilate their *thinking aloud*, the participants seem to reach a mutual understanding of the situation and formulate a shared strategy in a more stringent way than through a dialogue only using words. The interesting thing is that this means more opportunities for real change, involving both the users and the designers.

THE DIALOGUE PROCESS

At the beginning of the development of the Concepto method we focused on the communication process between the participants in the design process. We distinguished, on the one hand, the interdisciplinary communication between users from different disciplines restricted by linguistic barriers, and on the other hand, the communication between the architect and the users restricted by the asymmetry of the means of communication i.e. words versus the

architect's drawings and sketches. Firstly, after practicing Concepto, we became aware that the whole process is more complex than assumed. In fact, behind the interpersonal dialogue there are communication processes running at the individual level. This discovery made it clear for us that the communication process in question can be described as a mixture of three dialogues: an inner dialog, a self-dialogue and a dialogue with others.

The "inner dialogue" occurs in a "black box" and is not observable from the outside. Here, one can say that the subject "is thinking".

The "self-dialogue" is an externalisation of the inner dialogue. The idea or the concept is expressed by means of a sign, an image. The latter does not replace the idea or the concept, but represents it. The representing sign, in this case the image, is a means of reflection for the thinking subject. The image provides feedback to the subject. Here, one can say that the subject *"is thinking aloud"*. A good example is when the architect is sketching. Other professions or users might think aloud using key words on a paper, picking images or body languages. Everyone uses representations and can develop this task to facilitate a dialogue with themselves. In this process, the idea is expressed and externalised, making it possible to reflect again, to re-express it and so on.

The "interpersonal dialogue" rests on the preceding dialogue. Once the idea or the concept is expressed and represented by signs they can be perceived and interpreted by other subjects. In this case, there is a message and the answer or the reaction that the interpreting subjects provide is used as a feedback by the author of the message. Here, one can say that the subjects *"are thinking aloud together"*.

The inner dialogue is continuous in the world of thought. It forms the basis for the other dialogues and coexists with them. It is implicit and will not be discussed here. The other two dialogues are explicit and it is by learning how to know and handle them that it is possible to develop adequate methods and tools for a participative design process.

A dialogue by means of images and words goes through several levels. At the individual level, the participant communicates with himself/herself by means of pictures in order to concretise a problem or an idea that he/she thereafter communicates to the other participants. They interpret the message and send back reactions that serve as a feedback to the individual. He/she reviews the problem or the idea, re-articulates it and so on. In this manner, the group develops common concepts and a shared understanding.

This type of communication is not only a transfer of information between individuals. The choice of images, that is browsing through photo-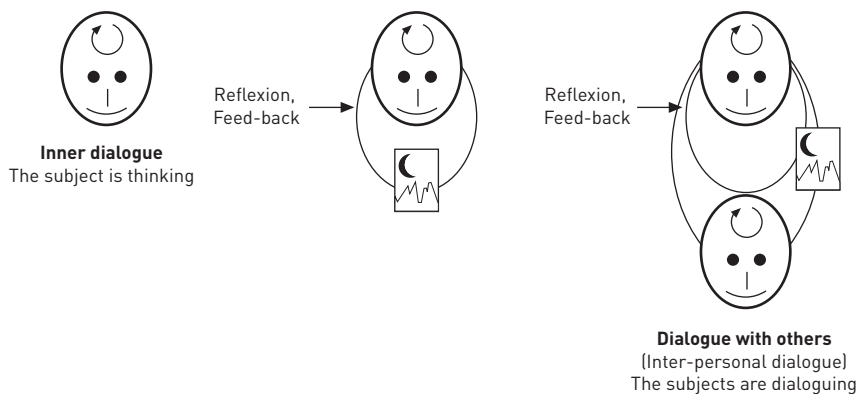catalogues or choosing prints from a pile of pictures, is a design process in itself. This act seems to help the lone individual to think and develop ideas in a more complex way than it would have been possible to do with solely verbal language. It was noticeable that in some experiments visionary aspects were more accentuated when images were presented, as compared to when only words were used. The participants expressed many more and varied aspects with the help of images than when expressing themselves in the customary verbal language. The users of the environment in question are often astonished as to how the pictures make it easy for them to find topics that they have not thought about before browsing through the pictures (Rehal 1997).

IMAGERY VERSUS NARRATION

In everyday life, illustrative and verbal communication are used parallel, complementing each other, for instance, as in a documentary film, a sport's programme on TV, advertising or in an instruction manual. However, one can also deliberately use them in sequence i.e. one after the other, for educational or rhetoric purposes. In order to increase attention and curiosity, a lecturer may choose to speak

A simplified illustration of the three dialogue levels

Inner dialogue
The subject is thinking

Reflexion, Feed-back

Reflexion, Feed-back

Dialogue with others
(Inter-personal dialogue)
The subjects are dialoguing

It became clear to us that the combination of picture and verbal language can be used in different ways and to different ends. The picture is not submitted to a system of rules as words are. It provides more room for creativity and imagination in communication. At the level of the dialogue between different professions, the picture can bring to light the participants' different ways of seeing and 30 each others' points of view. It also pays attention in this kind of dialogue to the fact that the picture at the individual level stimulates the participant and supports the establishment of a self-dialogue, in the same way as sketching does for the architect.

about his subject first, and then show pictures. The remarkable thing about different sequences is that they affect our understanding, depending on which order is chosen; show first and then talk, or the contrary. If you first relate something, and then show it in pictures, you will get a certain effect. But if you show the picture first and then talk, you will get another effect. In the first case, the listener in question forms two notions, or images around the same content. In the second case, the visual experience dominates, and hinders the listener from forming a personal version from the narrative. This is what happens when we see a film and read the book afterwards.

The way of using pictures to express something instead of using verbal expression or vice-versa has an impact on how a dialogue might be designed. Narratives and imagery have different effects in a communication situation depending on how they are used and when. Thus, if the architect enters the process too early, his/her graphic representations may hinder the participants from developing their own comprehensible images and visions. This is the main reason why Concepto is conceived to be used at the very beginning of the design process, before the designer starts making any proposal. At that stage, it is the users' needs, desires, visions, etc. expressed as properties of the future artefact, rather than its shape that are the object of discussion. The pictures used for that purpose are therefore of another character. It is the association, not the illustration, which is required here.

It is generally admitted that "a picture is worth more than a thousand words". The graphic image's iconic character makes it play this role in certain types of communication where the exact-

ness of the information transmitted is primordial. This kind of picture immediately represents something concrete and perceptible to our senses. It is necessary at the end of a design process, and there it plays an essential role. The architect's sketch or perspective drawing is a good example of that.

However, a picture can also exceed its iconic character and be used to communicate abstract phenomena, such as the sensation, the state of things, the mode of existence, etc. Used in this manner, the picture becomes an open sign to which different meanings can be assigned according to the imagination of the participant. It is the capacity of association that humans are equipped with, that we, in our research, try to exploit through the combination of words and pictures to develop our communication tool. One and same image can be associated to different things and, in the same way, one concept can be illustrated by different images by different persons. The content of the concepts then becomes negotiable. In this kind of communication, the picture acts as a key to opening the meaning that verbal language has fixed in the different *language games*. It is this way of using the picture that we argue for and attempt to implement in the initial phases of the design process.

Our ability to distinguish different aspects of the same phenomenon without confusing them, enables us to see in a fanciful manner, which is to see with imagination. In this way of seeing, it is not what is immediately discerned that is important, but rather what can be associated to an image. That is where the utility of the image has a big contribution to make. To see with imagination is the utility that is vitalised when using images in a dialogue.

A THEORETICAL APPROACH

There is a fundamental difference between discussing a concept verbally, and discussing it with the help of imagery used in an associative way. We tried a semiotic approach to better understand the difference between word and picture, but did not stop there. It is not the mechanisms of meaning that interest us, but rather the various effects that different manners to accommodate verbal language and pictures have on the participant's faculty of imagination, expression and understanding.

Let us approach language as such to understand why. Language is a system of symbols founded on conventions shared by individuals within the same linguistic unit. Every language is incomplete with regard to each individual and only exists in its totality in the speaking masses (Barthes 1985; Saussure 1987). Although different social groups in a society practice the same language, they do not make the same use of it.

Words in a language acquire their true senses in the use individuals make of them within a specific praxis (Wittgenstein 1992). Words do not signify phenomena or things but concepts (Ibid; Saussure 1987). The concept cannot be encompassed by a word in an absolute and incontestable manner. The word "light", for example, is not used in the same way by a physicist, a painter, a photographer, a prisoner, a politician or an architect, and does not designate the same concept in all these cases.

Thus, language is a sophisticated communication tool constituted as a system of rules; internal rules (grammar, syntax,

FIGURE 6

The design process seen as a successive construction of a language that ends in a real artefact
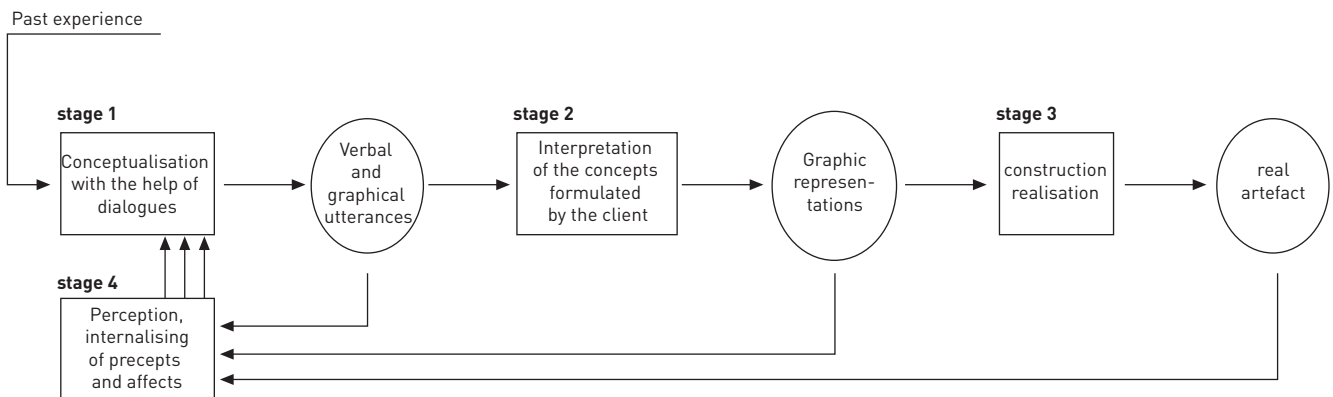
semantics) (Mounin 1968; Saussure 1987) and external rules (Wittgenstein 1992). To communicate pre-supposes mastering the language. This involves following the internal rules, and also mastering the language in praxis, which involves keeping to the external rules elaborated in a social practice. These two types of rules are often confused and one tends to believe that two people from the same linguistic unit can communicate without difficulty about everything. However, it might well happen, for example, that two farmers from two entirely different language groups on opposite sides of the world are better able to communicate with each other than one of these farmers with an academic from the same nation.

Consequently, the situation in the design process is that participants, although mastering the same language, do not master the language games that prevail in the different praxes. The situation is even more alarming in the initial phase of the process, since what is discussed in the dialogue does not yet exist at that stage and has to be formulated. What characterises this situation is the absence of common references and the lack of a common language, which means that the participants do not share the same world of concepts.

Concepts permit us to see and to conceive the reality in which we live - *"we see the world through our concepts"* (Winch 1990). Wittgenstein (1992) introduced the notion of "seeing as", to investigate the philosophy of perception. On this basis, we argue that we do not see phenomena and things as they come into our sight, but as we interpret them, and we interpret them by means of concepts we already have. In the same manner, our imagination is limited to modes of representation, bound in

among other ways to our professional, cultural, social and political identity. Thus, we tend more easily to look for solutions to our problems within the limits of what we already know. We are in practice "blind" to the concepts it is based on.

The concepts outside the natural sciences are far from being fixed or compact (Ramirez 2000). In architecture and planning, and particularly during the initial design phase, the concepts expressed verbally are diffuse. The content of a concept is compact only within a specific praxis and the language game in which it circulates. It cannot be communicated between players from different praxes without ambiguousness.

Thus, in a dialogue between participants in design processes it is necessary to deconstruct a concept in order to reconstruct a new one that better responds to their common situation. By doing so, the players elaborate a new language game embedded in the situation. Ignoring this state leads to misunderstandings in the design process. At its worst, the misunderstanding is underlying, and the participants although using the same language do not mean the same thing and even fail to realise they do not understand each other until it is too late and the artefact is materialised.

How is it possible to get around these difficulties? A foreseeable solution advocated in this research would be to complement the verbal language with pictures used in an associative manner. If words used in everyday language have a sense in what Wittgenstein calls a language game, that is the way in which they are used in such and such praxis; the associated picture, on the contrary, is more neutral and seems as being "virgin of sense" before its circulation in the specific dialogue.

In actual fact, the dialogue by means of images provides the opportunity to get round the implicit and inherent conventions of verbal language. Moreover, after experimenting with this type of dialogue, we now consider that verbal language may be an obstacle in the dialogue between participants with different experiences and from different professions, especially in the initial phase of a design process.

Of course, as stated earlier, the picture is not the only possibility; other means could be foreseeable. But the picture has the advantage of filling several functions in the dialogue. Firstly, it allows the participant to lead a self-dialogue. It shows distinctly and subtly divergences in the way of seeing things between different groups. It serves to open up the sense that the verbal language closes in language games. The picture is, through its free association, a sign virgin of sense that serves to open up views and construct the new language appropriate to the design situation. It is also easily remembered as a shared meaning to carry through a design process. Another advantage is that it is an easy and quick method to use.

CONCLUSION

Conceiving an artefact starts with an activity of conceptualisation. The concepts are our creation, and they are instruments by which we can see the world and transform it. They are always developed through communication in our social activities within communities, professions, cultures or just a group of people doing something

together to constitute the language games that compose our language. In a language game, the concepts are shared by a group of people and are the fundament and the identity of this group. According to the discourse theory (Winther Jørgensen and Phillips 2002) they are paradigms or discourses that vehicle the knowledge and know-how of that particular group. At the same time, there is a risk that these paradigms become a field of specialised knowledge, a language game surrounded by linguistic barriers that make the interdisciplinary communication difficult.

In our view, creativity lies in the friction between different paradigms and language games. The linguistic barriers are thus necessary creativity agents. They need to be overcome but not eliminated. To overcome these barriers does not mean making communication more fluid, but rather to give each discipline the possibility of reconsidering its concepts in the light of other points of view. By so doing the project will expand the limit of its language game and develop a new one with new concepts that can be shared by the whole organisation/project.

The artefact being sought after – a house, a workplace, an urban district - that at beginning of a design and planning process does not exist (not in the mind, not as any representation, not in reality) is progressively constructed as a language by the people involved in the planning activity. This construction is carried out as a deconstruction of previous languages that are not compatible with the new experience that the people involved are facing in the new design situation.

Human language opens up new worlds, but at the cost of a "schooling" shaped by the fact of "following the rules"; it is what makes us unable to see in front of our very noses and eventually closes us in our modes of representation. Design, however, gives us the opportunity to reconsider these rules and our modes of representation, to construct new language games, to develop the language and to open up new doors, to find new ways to form our human landscape.

The artefact can thus be seen as a language in constant construction during a process of change (Ehn 1988), from words, to graphical representations, to newly-built structures. The final product is a confirmation of this process, but also the beginning of a new one. We always start in the middle, thinking has no beginning (Deleuze 1996). This construction is an act of design that, as we attempt to show, is achieved at different levels and is enriched by the participation of a wide variety of people involved. These have knowledge to bring into the process and are concerned by its results. Thus, design is not just an expert matter. Introducing new means, like images, into a process of change opens up possibilities for such participation, for developing a democratic practice that brings to light hidden worldviews that can help human activity to realise what otherwise would remain unthinkable.

The lesson to be learnt from our experience is that it is important that the users in participative design processes get the opportunity to really reflect about their situation when changes in their organisational or physical environment are about to be initiated. User participation might otherwise be reduced to a process conducted by an expert who gathers knowledge in verbal form through questionnaires or interviews, or the reactions from a document or plan, the users' experiences, desires, needs and visions. The users' imagination will be somewhat constricted and it will be difficult for them to conjure up solutions for their problems outside the limits of what they are already able to directly express.

Thus the act of thinking aloud is important in any change process. It is often neglected because it is often confused with the inner dialogue, and also because it is generally admitted that the users have the answers to the questions that concern them and do not need to reflect too much about them. The discovery of this self-dialogue has clarified the structure of the whole chain of possible communication in a process of change. A dialogue using representations that make it easy to illustrate experiences and feelings can enable both the users and experts to *think aloud together* in a symmetrical manner.

We mean that not enough attention is devoted to what happens to the participants during a design process in research dealing with participative design. We argue that the participants develop themselves during their attempts to think about, reflect on and acquire an image of their future environment. Our research experience has drawn attention to the relevance of the *rights* of users to not just be heard, but to *think aloud* and to design the environment and at the same time change themselves. The right *to think aloud*, that is *to design*, is not just a result of making processes of change more knowledgeable and democratic; it is also what helps to develop democratic practices.

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