

# Communicating with Laypeople

*Elisabeth Hornyanszky Dalholm  
Birgitta Rydberg-Mitchell  
Full-Scale Laboratory  
Department of Building Functions Analysis,  
School of Architecture, University of Lund  
Box 118, S-22100 Lund  
Sweden*

## Summary

The purpose of architects' tools is, generally stated, to help architects develop and visualize spatial ideas and intentions. But tools are also used to communicate with other groups of professionals and laypeople. This paper deals with how the choice of tools affects the communication between laypeople and architects. It also stresses the need of combining different media in order to create the best conditions for user participation. If users are to influence the planning, they must understand the "language" of the medium and have the ability to use it themselves. Models on diverse scales, and first of all on scale 1:1, fulfill these demands better than drawings. However, there are distinct limitations to the full-scale model, when it comes to giving the users a comprehension of the entire building, and thus models on smaller scales are required. Limitations of both full-scale and small-scale models concerning the exterior environment and the building's place in this environment could possibly be overcome with the help of computer simulation.

## Résumé

En formulant de manière générale, on peut dire que les outils utilisés par les architectes doivent aider ces derniers à développer et à visualiser idées et projets spatiaux. Mais ces outils sont aussi employés pour communiquer avec d'autres groupes de professionnels et de non-spécialistes. Cet article traite de la manière dont le choix des outils influence la communication entre les non-spécialistes et les architectes. Il souligne également qu'il faut combiner différents médiums pour créer les conditions dans lesquelles les utilisateurs sont le mieux à même de participer. Pour que les utilisateurs puissent avoir une influence sur la planification, il faut qu'ils comprennent le "langage" du médium et soient capables de l'utiliser eux-mêmes. Dans ce sens, les modèles à différentes échelles – et surtout à l'échelle 1:1 – sont plus utiles que des dessins. Et pourtant le modèle grandeur nature se heurte à des limites claires lorsqu'il s'agit de fournir à l'utilisateur une perception de l'ensemble du bâtiment; il faut donc lui offrir des modèles à plus petite échelle. Il devrait aussi être possible d'utiliser des simulations par ordinateur pour surmonter le fait que les différents types de modèles ne réussissent pas à donner une image des rapports bâtiment – environnement.

## 1. Introduction

The Full-Scale Laboratory at the Department of Building Functions Analysis has been an integral component of the School of Architecture in Lund since it was built in 1964. The laboratory has an area of 18 x 15 metres with a height of 5,8

metres. There is a mobile platform measuring 13 x 8 metres. The modelling kit includes lightweight wall panels, each 240 cm high and with widths of 10, 15, 20, 30 or 60 cm. Additional elements include door and window frames. In addition to the building elements the laboratory is equipped with kitchen fittings, bathroom equipment and some basic furniture. Close to the localities there is a well equipped workshop for carpentry, metal-work etc. The laboratory also has photographic and video equipment to record the activities carried out. There is a small-scale modelling kit, on a scale of 1:10, to replicate the full-scale components.

The laboratory has been used for teaching programmes, for theoretical and applied research and for professional practice. During the last ten years the laboratory has mainly been used as a tool to facilitate the participation of users in the design process concerning rehabilitation and new construction of working places as well as dwellings.

In a design process with users' participation the communication between users and architect is of vital importance. If users don't manage to express their requests clearly enough or if the architect fails to inform about the consequences of different layouts, users will not be able to make proper decisions and most probably the environment will not correspond to the users' needs and intentions. The users' ability to handle different media and to interpret them is therefore an important question to those concerned with users' participation.

The aim of the research being carried out in the full-scale laboratory in Lund is to focus on the specific qualities of the full-scale media in connection with user's participation through case studies. Here we will present our experiences from various full-scale studies carried out during the past ten years, but mainly based on a study where the full-scale method was compared to other methods. The study deals with the design process of a rented housing project outside the city of Helsingborg in the south of Sweden. On the basis of their individual requirements, twenty households from the municipal housing queue were offered the opportunity of planning their dwellings. They could decide on the layout as well as on the choice of building materials and to a certain extent on the distribution of costs.

The programme was initiated by the researchers in the full-scale laboratory and carried out in cooperation with the housing company and an architect's office. The researchers, trained architects, developed the layouts together with the users while the main task of the architect's office was to coordinate the users' housing designs into a site plan and to make the drawing documents for the building permit.

The most common way for the architect to communicate with users is through building drawings but, in the project in which we were involved, users were given the opportunity of developing their own ideas with the help of both small-scale and full-scale models. The architect and the users discussed together the drawings on different occasions, but the architect did not participate actively in the work with full-scale models. Researchers functioned as a link between user and architect. This situation complicated the process, since much of the information wasn't communicated directly - user, architect, researcher - but passed on second-hand, through sketches as well as verbally.

We regard dialogue as an important tool, independent of the media being used. Verbal expression is the most natural way for the user to communicate visions and de-

sires and it must be used consciously in combination with other media. This will not, however, be discussed here.

## **2. The Architect's Tools as Communication Media**

Since our intention is to develop and evaluate the full-scale simulation as an aid to users' participation, we will discuss tools as a means of communication rather than as a professional tool for the architect himself.

Our impression is that many architects feel uncomfortable about users' participation. This might be due to this being an unusual situation for the architect: he finds it difficult to fulfill both the users' and the builder's demands. Our experience is that the architect wants to assist the users, not only with pure planning solutions, but also with his view on architecture. He communicates a view on architectural style which is influenced by current ideas, but also by his personal concepts on organizational relationships and on the size and position of openings. Naturally an architect can regard himself as the expert in creating environments for less conscious users. But, in a process involving users' participation, if he finds differences in values he may enlighten the users on the consequences of their choices instead of using his advantage as an expert, forcing certain solutions upon them. In our study there have been numerous examples of such difficulties and in some cases the users showed their discontent by leaving the whole project.

By cooperating with users and having access to their specific knowledge and experience, the architect has the opportunity of developing as a professional. We would even say that the architecture gains new qualities through this cooperation. When users are given the opportunity to assert their demands, a variance is suggested in the design. Environments become articulated according to specific demands and preferences and the architect's task becomes to create a whole out of this diversity.

## **3. The Assessment of Different Media in the Communication with Laypeople**

### *3.1. Drawings*

#### *3.1.1. The architect's drawings*

In our experience the laypeople's ability to interpret an architectural drawing varies tremendously. Some laypeople have learnt to interpret drawings of different kinds in their professions. Others try to interpret the drawings by comparing the setting on the drawing with existing surroundings. There are also people who are extremely committed in the planning of their own dwelling and who develop during this process a skill for reading and understanding drawings. To sum up, the drawing communicates different information to different laypeople.

Our findings show that users generally understand the spatial organization shown by a drawing, but not the meaning of the spatial relationships. The users can understand the shape of the room surface but not its dimensions or other spatial qualities nor the suitability of the rooms for their intended functions. A lack of knowledge on the symbols used in architectural drawings results in misunderstandings

concerning window openings, doorways and interior decoration, and thus they can not be assessed as spatial or functional elements.

Interpreting the scale of drawings may also represent a difficulty. What does 3 cm on a drawing mean if you don't have the ability to translate this abstraction to something concrete, e.g. the width of a sleeping-room in the concrete dwelling? In spite of these difficulties, most laypeople manage to obtain a rough understanding of what the drawing represents. Drawings of facades and elevations, presented in a logical manner in connection with the plan, also facilitate understanding.

### *3.1.2. The laypeople's drawings*

At an initial stage of our study some of the users were asked to make a plan of their future dwelling. It seems that laypeople may find it quite hard to draw a plan with pen and paper. It is not only a question of being able to draw a straight line with the help of a ruler, or to draw double instead of single lines, or to know the standard symbols used by architects. It is more a question of being able to transform a three-dimensional idea with an abstract form to one that can be interpreted by others. By making their own drawings from the beginning, instead of relying on those of the architect, the user will, however, be confronted with this problem and work on comparing drawings with reality.

From our study we conclude that users have a comparatively good ability to organize and present relationships between rooms and functions. They are able to illustrate where, for example, the different rooms of a dwelling could be located, how large they would be, how they would be connected to each other and how the kitchen, should be organized. Quite often users are conscious of the location of openings as well. But we were also surprised to find out how difficult it is for users to join together the different components that make the dwelling into a functional wholeness.

Since, however, users in general have no knowledge of building regulations there exists a definite risk of making basic mistakes in a participation process. For instance, users may easily neglect dimensions and functions in smaller spaces. In the users' drawings, bedrooms, bathrooms and clothes closets are quite often too small and doorways and other passages are too narrow. Incorrect dimensions for closets, kitchen- and bathroom equipment may also be given. All these mistakes will of course be corrected during the design process.

However, the users' drawings, including personal and original solutions, often represent a synthesis of goals which they have set for themselves. But by themselves the sketches seldom provide a good enough idea of the users' visions. For example, users are very often not aware of the course of the light and the window fittings, this being a complex problem. Thoughts on these characteristics are rarely as clear as those on connections between the different rooms of the dwelling.

The architect will pay attention to users' sketches depending on how he considers user influence. The architect may only take into account what corresponds to his own values, current rules or the wishes of the builder. In our project, for instance, the architect chose another roof pitch and roofing than the users had requested since his intention was to coordinate the appearance of these dwellings with ones situated next to them.

The architect may also overestimate user consciousness. On the basis of sketches that are often simple and incomplete, it is difficult to understand which priorities are important to the user. The routine in our projects has been to complete all drawings of models with a summary in writing. We think, however, that a respectful and open dialogue is the best basis for the work to come.

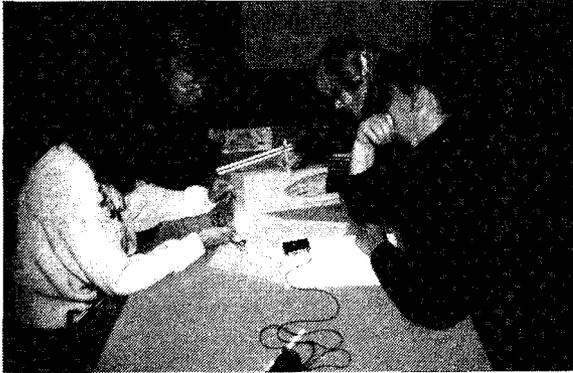


Fig. 1 Discussing and working with users' plans.  
Discussion et travail avec les plans des utilisateurs.

### 3.2. *The model on scale 1:10*

In the cooperation process we also used a model on a scale of 1:10 with the same wall modules as in the full-scale model. Furthermore, in the small model, furniture and other interior decoration are represented to clarify the spatial dimensions. This model was chosen because we had it on hand but also because it is similar to the full-scale model. The mock-ups could easily be remodelled, a similar method could be used for modelling. It was thus also possible to compare results between the two scales.

Our experience is that the 1:10 model gives to the user a better overview of a building than a drawing, and that it also creates better conditions for an evaluation of the functions. By this we mean, for instance, how the spaces of the dwelling are connected with each other, how they can be furnished and the contact between the rooms. The height dimension transforms the spaces into volumes, which creates a more realistic picture of the dimensions of the room. Also, the understanding of the design of the façade seems to improve with this model.

Our impression is that it is above all in the cases where users haven't succeeded in completing the drawings for a well-functioning plan that the 1:10 scale model can serve an important purpose. Instead of drawing on paper, one can "draw", using the small modules. The work can be compared to sketching, where the surrounding lines immediately disappear and where the possibilities and limitations of the other spaces become visible at once. The small model is perceived as lucid and, for instance, the work with the window-fittings becomes more real than when using drawings. Also

openings between different rooms/functions, their size and position, are clarified by the third dimension.



Fig. 2 The model on the scale of 1:10 can easily be changed and activates the users.

Le modèle 1:10 peut facilement être modifié et donne des idées aux utilisateurs.

The work is quickly completed, it is flexible and gives a comparatively clear vision of the real environment.

### 3.3. *The full-scale model*

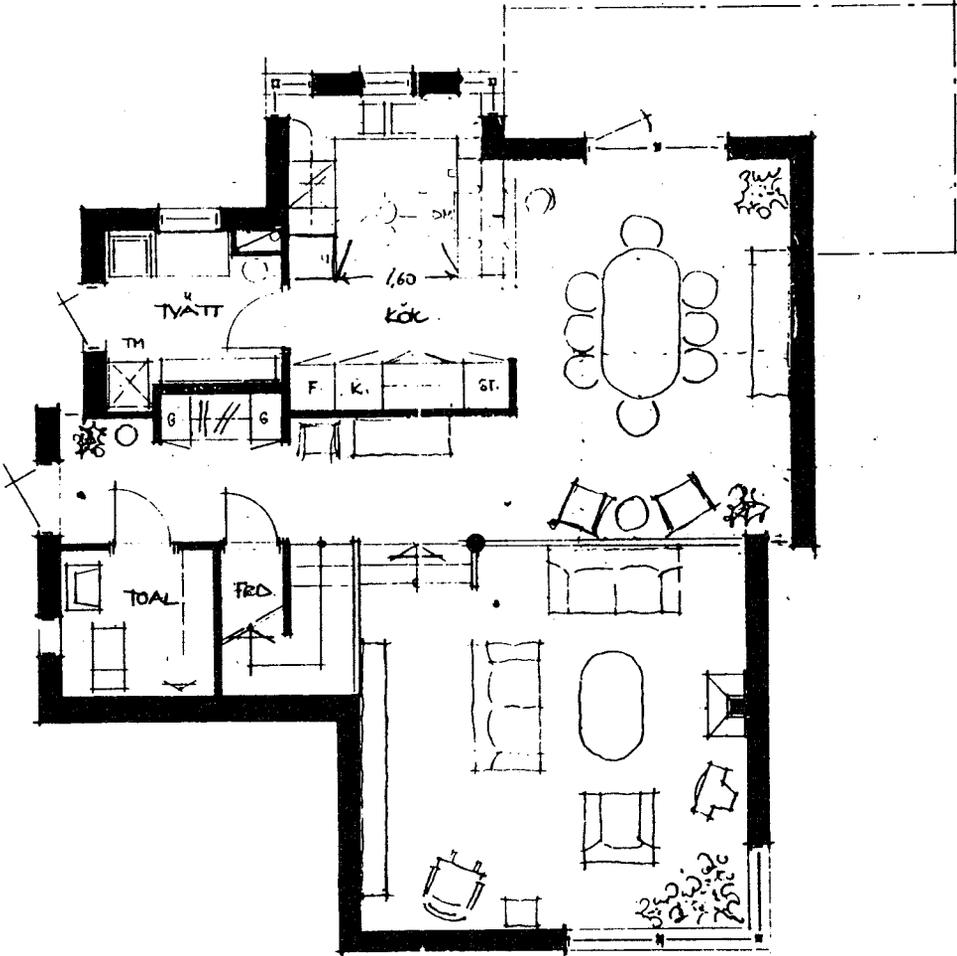
The user perceives a dwelling environment mainly from the inside, while the architect emphasizes the exterior to the same extent. He often starts the work from the idea of a building volume rather than practical functions and other interior demands that may be made on the building. This doesn't mean that the exterior is of no importance to the user. In our project some of the users have emphasized their wish to create an interesting exterior by making an extremely irregular layout.

The full-scale method's power to visualize different aspects of the physical environment is partly dependent on the building system being used. The panels used in our laboratory at Lund are more suited for studies of the interior functions, and less for studies of façades, while the building-blocks used in Lausanne\* may very well be used to articulate the design of a façade. Consequently our ability to help users develop their ideas on exterior aspects are limited.

For a layperson, to be confronted with a setting built in full scale naturally differs in many ways from working with other media. When it comes to evaluating

\* LAE - Laboratory for architectural experiments, Swiss Federal Institute of Technology, Lausanne.

whether a specific space corresponds to demands and existing expectations, the full-scale method is superior. As well as giving the participator the opportunity to study dimensions, areas and spaces, the method creates better conditions for testing light distribution and different furnishing alternatives, as well as for designing details in the decoration. Thanks to the full-scale, it is possible for the user to act in and experience the environment. This is the dimension which is unique to the full-scale model.



Layout 1

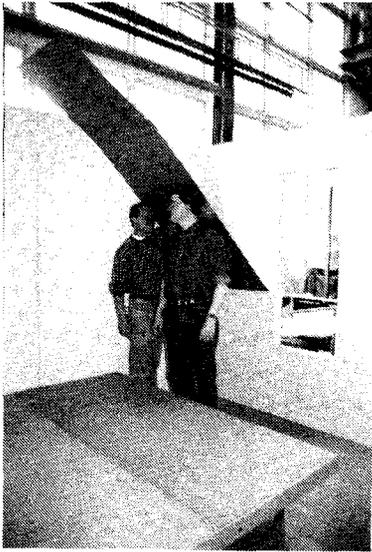


Fig. 3 Different roof inclinations are tested with simple means.  
On utilise des moyens simples pour tester différentes pentes de plafond.

The limitations that exist in viewing the full-scale mock-up from above makes surveying difficult. The shape of our panels but also the size of the mock-up and the small hall bring difficulties in perceiving façades as well.

The small 1:10 scale mock-up is perceived as a doll's house when compared to the full-scale mock-up. After being given the opportunity to work with full scale, most users feel that the 1:10 scale has been unnecessary and of no use. However, we think that this merely expresses the fact that nothing, neither drawing nor small scale models, can surpass looking at and working with an environment in its real volume. Meeting with the full-scale mock-up gives a permanent impression, while working with the small-scale model gives temporary information.

A drawing is a more abstract representation than a full-scale mock-up. At the same time, however, during the full-scale mock-up process users may learn to read plans if, during the process, one alternates between working with drawings and working with the environment in full scale. This thus becomes a learning process for interpreting drawings.

An interesting phenomenon is that most users quite easily accept that their sketches on paper are questioned, while they find it harder to be questioned when it comes to mock-ups representing their ideas. We believe that this comes from the users' feeling that the expert has a more realistic perception of the drawing than themselves while they are more self-confident when examining the full-scale mock-up.

Our study also shows that users exhausted the possibilities of expressing their requests with plans and the 1:10 scale mock-up much faster than with the full-scale mock-up.

#### **4. The Necessity and Need of Combining Different Media in User's Participation**

##### *4.1. The full-scale modelling combined with sketches and smaller models*

Most users find it very hard to present their ideas in drawings. For many of them it is a difficult and frustrating work. This is why it is important for the professional to be sensitive to what the user really intends to show in the drawing. This understanding can be achieved through a dialogue with the user and through working together with the user in order to obtain a well functioning plan. In spite of what we have learnt about the superiority of models as media, we consider it advisable to start the cooperation process by working with sketches.

We have already mentioned what the user can deduce from a drawing, and we observed that many dimensions can't be experienced through this medium. Therefore, we suggest that work with sketches should not be carried too far. We also consider that it might prove useful for the architect to build a 1:10 scale model while the dialogue is in progress.

Depending on the complexity of the environment and the ability of the user to read a drawing, the choice of a scale should be suited to subsequent development after the initial sketching phase. Even large and complex dwelling environments may well be investigated in a 1:10 scale. Users who have difficulties in interpreting drawings may use this scale as an understandable intermediary to the full-scale mock-up. In some cases it is quite possible to work with the full-scale mock up immediately.

One may meet with basic problems while working on the full-scale mock-up. If this entails the whole plan being reconsidered, there may be a need for using a different media. In this situation, the expert will find it natural to use sketches and drawings. It is his way of finding new ways. The laypeople may then be more able than before to interpret and understand the drawings but they can seldom revise the sketch on their own. Here it is very useful to have access to a 1:10 scale model and to test different solutions before they are built into the full-scale mock-up. Of course it may also be interesting to examine the premiss of other small-scale models.

Sometimes, when participants are faced with problems that they have not noticed or taken any interest in before, they find it difficult to understand the suggestions made by the researchers orally and via sketches. We then chose to mark out walls and furnishing with the help of superimposed elements and to discuss these before the mock-up is made.

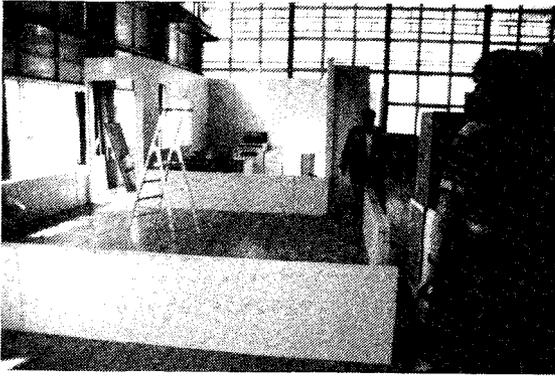


Fig. 4 Thanks to the laying panels the users are able to perceive the spreading of the room.  
Les panneaux permettent aux utilisateurs de saisir l'étendue de la pièce.

#### 4.2. *The computer technique combined with full-scale modelling*

Since the building system in our laboratory in Lund is not suited for studies of façades it might be possible to complete it with building blocks similar to those used in Lausanne. Another possibility would be to use a computer programme for dealing with colour, shape, shadows, three dimensional or animated drawings etc.

Our experience so far shows that the software is too complicated and time-consuming to work with. In our opinion computer presentations could be an asset primarily when the planned environment is to be related to surroundings. To simulate a view from a window, or to experience the closeness to the neighbour's house from a certain point, are examples of this.

In the design process, users' wishes and financial restrictions are two types of factors that have to be reconciled. These factors are also the most common sources of conflict. However, if laypeople have the finances to plan large areas, the problem of solving the desired functions and connections can be smaller than they sometimes are. This is the type of comment we get from users; if it was possible to increase the area by 50 percent, there would be no obstacles to obtaining the optimal solution for the plan quality. Having access to a calculation program (e.g. ArchiCAD) with reliable information on production costs based on different requirements, would improve the user's chances of making well-founded decisions on a financial basis.

## 5. Conclusion

When it comes to the choice of different communication media in order to improve the participation process, an important criterion is that the users themselves should be able to work with the media. This is especially important when it comes to the emancipation of the user's creativity in the process. Our foremost objection to computer technique in its present form is that the users are generally not able to con-

trol the media. They are perhaps still more dependent on the communication with the person who controls the media than when they are working with drawings. And as the computer use seems to increase it is important that the architects are aware of what three-dimensional drawings communicate to laypeople. The technique and beautiful pictures could make them believe that they are more committed to the users than when using traditional tools.

We believe that despite its deficiencies the full-scale mock-up is the most appropriate medium now available for communication with laymen.



Fig. 5 The panels, being light, facilitate active participation of the users in the modelling work.

Les panneaux sont légers, ce qui permet aux utilisateurs de participer plus activement au travail de modelage.