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COMMUNITY–BASED RESEARCH AND THE DEMOCRATIZATION OF SCIENCE AND TECHNOLOGY.

A FRAMEWORK FOR THE EVALUATION OF SCIENCE SHOP WORK

PhD DISSERTATION

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ABSTRACT

This thesis investigates the democracy perspectives present in community-based research initiatives at technical universities. It focalizes on science shops as one particular movement within this field that from its beginnings in the 1970s in the Netherlands has shown an explicit claim of contributing to the 'democratization of science and technology'.

The most commonly used theoretical reference that sustains this claim is the concept of *strong democracy* which has been interpreted in terms of community-based research by Richard Sclove (1995). According to this perspective, the contribution of science shops to democracy is based on its commitment to a 'demand-driven approach': science shops make research respond directly to the needs expressed by citizen groups; this way, they simultaneously 'empower' these groups and promote the inclusion of their concerns into university research and teaching.

This democracy perspective comes short, however, in explaining science shop practice. The thesis explores the question whether science shop practice may enact alternative democracy perspectives corresponding to an *issue-centered approach* (Marres, 2005; 2007) and the principles of technical democracy (Callon, Lascoumes and Barthe, 2009). It does so by studying the work of the Science Shop of the Technical University of Denmark, with a particular focus on a collaborative research process in urban planning facilitated by this institution. A reflexive assessment of a pilot project for a science shop at the Universidad Politécnica de Valencia serves to develop this exploration further.

The analysis of the observed practices shows the analytical potential of the issue-centered perspective for a better comprehension of science shop work and its democratic relevance. It allows equally to orient the evaluation of such work. On this basis, a theoretical framework is proposed that conceives evaluation as part of experimentation. The framework invites to understand science shop work as a progressive and collective exploration, definition and redefinition of a critical role of universities in society. A list of nine 'axes of problematization' is offered to serve as guidance for structuring such experimentation. By this means, the thesis contributes to theory-building on the contribution of science shop work to democracy, at the same time as it offers the groundwork for such theory-building to take place between science shop practitioners and their peers.

Key words: science shops, community-based research, democratization of science and technology, collective evaluation

RESUMEN

Esta tesis trata sobre las perspectivas democráticas presentes en iniciativas de investigación basada en la comunidad en universidades técnicas. Focaliza sobre un movimiento particular dentro del campo, las *tiendas de la cienca* (science shops), que desde sus orígenes en los Países Bajos en los años 1970 reivindica su contribución a la 'democratización de la ciencia y la tecnología'.

La referencia teórica habitual que sostiene esa reivindicación es la interpretación dada por Richard Sclove (1995) del concepto de la *democracia fuerte*. Según esta perspectiva, la contribución de las tiendas de la ciencia a la democracia se basa en su 'enfoque basado en la demanda': las tiendas de la ciencia hacen responder la investigación directamente a las demandas expresadas por colectivos ciudadanos; de esta forma, 'empoderan' esos colectivos y promueven a la vez la inclusión de sus preocupaciones en la investigación y enseñanza universitaria.

Sin embargo, esta perspectiva democrática no da cuenta del trabajo efectivo de las tiendas de la ciencia. La tesis analiza la práctica de las tiendas de la ciencia desde una perspectiva democrática alternativa que se corresponde con un *enfoque centrado en los 'issues'* (Marres, 2005; 2007) y a los principios de la democracia técnica (Callon, Lascoumes y Barthe, 2009). Estudia para ello el trabajo de la Tienda de la Ciencia de la Universidad Técnica de Dinamarca, y en particular un proceso de investigación colaborativa en planificación urbana facilitado por esta institución. La evaluación reflexiva de un proyecto piloto llevado a cabo para impulsar la creación de una tienda de la ciencia en la Universidad Politécnica de Valencia completa la investigación.

El análisis de las prácticas observadas mediante la perspectiva centrada en los issues muestra el potencial de este enfoque para una mejor comprensión del trabajo de las tiendas de la ciencia y de su relevancia democrática. El análisis permite igualmente orientar la evaluación de dicho trabajo. En base a ello, se propone un marco para evaluar la práctica de las tiendas de la ciencia en términos de experimentación. El marco de evaluación invita a concebir el trabajo de las tiendas de la ciencia como una progresiva exploración, definición y redefinición colectivas del rol crítico de la universidad en la sociedad. La propuesta se concreta a través de nueve 'ejes de problematización' que sirven de guía para estructurar la experimentación. De esta manera, la tesis contribuye al desarrollo teórico sobre la contribución del trabajo de las tiendas de la

ciencia a la democracia, a la vez que ofrece un fundamento para que tal desarrollo teórico pueda desarrollarse desde la práctica misma.

Palabras clave: tiendas de la ciencia, investigación basada en la comunidad, democratización de la ciencia y la tecnología, evaluación colectiva

RESUM

Aquesta tesi tracta sobre les perspectives democràtiques presents en iniciatives d'investigació basada en la comunitat en universitats tècniques. S'enfoca a un moviment particular dins del camp, les botigues de la cienca (science shops), que des dels seus orígens als Països Baixos en els anys 1970 reivindica la seua contribució a la 'democratització de la ciència i la tecnologia'.

La referència teòrica usual que sosté aquesta reivindicació és la interpretació donada per Richard Sclove (1995) del concepte de la *democràcia forta*. Segons aquesta perspectiva, la contribució de les botigues de la ciència a la democràcia es basa en el seu 'enfocament basat en la demanda': les botigues de la ciència fan respondre la investigació directament a les demandes expressades pels col·lectius ciutadans; d'aquesta forma, atorguen força a aquests col·lectius i promouen alhora la inclusió de les seues preocupacions a la investigació i l'ensenyament universitari.

Tanmateix, aquesta perspectiva democràtica no esclareix el treball efectiu de les botigues de la ciència. La tesi analitza la pràctica de les botigues de la ciència des d'una perspectiva democràtica alternativa que es correspon amb un *enfocament centrat en els 'issues'* (Marres, 2005; 2007) i als principis de la democràcia tècnica (Callon, Lascoumes i Barthe, 2009). Estudia, per a això, el treball de la Botiga de la Ciència de la Universitat Tècnica de Dinamarca i en particular un procés d'investigació col·laborativa en planificació urbana facilitat per aquesta institució. L'avaluació reflexiva d'un projecte pilot dut a terme per impulsar la creació d'una botiga de la ciència a la Universitat Politècnica de València completa la investigació.

L'anàlisi de les pràctiques observades mitjançant la perspectiva centrada en els issues mostra el potencial d'aquest enfocament per a una millor comprensió del treball de les botigues de la ciència i de la seua rellevància democràtica. L'anàlisi permet igualment orientar l'avaluació de l'esmentat treball. Partint d'això, es proposa un marc per avaluar la pràctica de les botigues de la ciència en termes d'experimentació. El marc d'avaluació convida a concebre el treball de les botigues de la ciència com una progressiva exploració, definició i redefinició col·lectives del rol crític de la universitat en la societat. La proposta es concreta a través de nou 'eixos de problematización' que serveixen de guia per estructurar l'experimentació. D'aquesta manera, la tesi contribueix al desenvolupament teòric sobre la contribució del treball de les botigues de la ciència a la democràcia, alhora que ofereix un fonament perquè tal desenvolupament teòric puga desenvolupar-se des de la pràctica mateixa.

Paraules clau: botigues de la ciència, investigació basada en la comunitat, democratització de la ciència i la tecnologia, avaluació col·lectiva

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This thesis sets out to define a framework for evaluating science shop work. It offers a fresh perspective of the possible role of university-based science shops and similar community-based research initiatives for the democratization of science and technology – a relevant and fruitful undertaking, as I will argue in the following lines.

The democratic claim has been present in the science shop movement from its beginnings in the 1970s in the Netherlands. Early science shops aimed at a radical transformation of both science and society, making the university research and development activities respond to the demands of disadvantaged social groups. At that moment, the science shop movement was informed and supported by scholars of the incipient field of Science and Technology Studies (STS). Later on, the theoretical perspective of strong democracy developed by Benjamin Barber (1984) has become a widely used reference in order to express the science shops' democracy claim, certainly thanks to its interpretation offered by Richard Sclove (1995) in terms of community-based research. The contribution of science shops to democracy is justified by their 'demand-driven approach': by making university R&D activities respond to the concerns of civil society groups, science shops help to 'empower' these groups and simultaneously to reorient university R&D.

This interpretation responds to a particular perspective on engaged science that equals increased participation of citizens in science and technology to an increased democratic governance of these activities. While this perspective is possibly characteristic of early STS work, there is a growing corpus of studies on the politics of participation that refutes such equation of participation and democracy. Yet, science shop work has not received much attention in this evolving scholarly work. Accordingly, there has been only limited renewal of theoretical perspectives on the contribution of science shop work to democracy. This research proposes rethinking science shop practice from new theoretical angles. It proposes an interpretation of this practice in the light of the issue-centered perspective on democracy as developed by Noortje Marres (2005, 2007) and resonates with the principles of technical democracy as outlined by Callon, Lascoumes and Barthe (2009). These pragmatist STS perspectives allow to understand the democratic potential of science shop work beyond the

support of specific, 'weak' social groups. Instead, it may be conceived as the promotion of a collaborative and critical exploration of the *issues* these groups are concerned by.

The thesis offers a renewed ground for understanding and evaluating science shop practice. It proposes a particular way of reconnecting the field of STS and science shop practice – not only by showing the interest of a particular strand of STS for informing science shop work, but also by pointing to the potential interest of science shop work for developing STS theory. This mutual interest is shown to be grounded in the challenges and uncertainties that science shops cope with when pursuing their mission of promoting a critical role of university in society. The here proposed framework for evaluation invites to appreciate science shop work as an experimentation, heading towards a progressive and collective inquiry of how their mission may be achieved. This way the framework responds the need for a coherent theoretical fundament with articulated criteria for understanding and evaluating science shop work, at the same time as it conceives such fundament and criteria to be defined and redefined through the collective experimentation.

METHODOLOGY

In order to develop the envisaged new ground for understanding and evaluating science shop practice, I have analyzed different aspects of science shop practice and I have done so from different angles. I have carried out a case study looking at the performance of a particular science shop and I have analyzed an own experience. My approach was exploratory, seeking to develop an understanding of the possible democracy claim of science shop work on the basis of my empirical study in dialogue with theory.

The role of theory was hence not to provide hypotheses that would be confirmed or refuted through the case studies. As an exploratory case study (Yin, 2003:23), the adopted approach may be considered here closer to grounded theory (Glaser and Strauss, 1967) in its assumption that theory should be built on empirical study. The research process has developed in a *movement between* theory and practice, allowing theory to evolve with the empirical study. Working hypotheses have played here an important role in orienting the research and in providing a position that would be challenged by the empirical study. This way, progressively a theoretical interpretation has been elaborated that is considered to withstand the challenges from the analyzed cases.

Critiques to case-study research designs often emphasize the impossibility of generalization. However, strong arguments defend the possibility and the interest of generalizing from case studies. They argue for the role of case studies for theory-building beyond its employment as a preparation of "the real study's larger surveys, systematic hypotheses testing, and theory-building" (Flyvbjerg, 2007:390). They highlight in this the value for scientific development of "concrete, practical (context-dependent) knowledge" generated through a case study (ibidem, p.391). It should be clarified that the kind of generalization aimed at in this research does not aim at universal validity, but certainly at making a valid contribution to theory-building on science shop work – as I will discuss in more detail in chapter five.

I have approached science shop practice through a mix of a case study analysis and an assessment of my own experience with science shop work: I have studied one particular science shop as an 'outsider' to it, and I have reflected on such work from the inside. This research design has allowed to consider my research question from different positions towards the analyzed object, provoking different dynamics of attachment and detachment towards it (Callon, 1999).

Concerning my outsider analysis of science shop practice, I chose to study the work of the Science Shop[1] of the Technical University of Denmark (Danmarks Tekniske Universitet, DTU). I selected this science shop because of (1) its long trajectory of more than 20 years, (2) its explicit goal of contributing to the democratization of science and technology, and (3) its concern for doing so by working in particular on the missions of teaching and research at its technical university. These aspects made it appear to be a particularly interesting object of study for exploring my research question: I could follow a science shop in its effort of making sense of its democratic claim in its work on the different missions of university, and I could rely here on the study of its daily practice as well as of its history.

This study had been conceived as an 'embedded case study' (Yin, 2003:42): to inquire the democratic effort contained in the Science Shop's practice, it was considered necessary to look both at concrete community-based research processes and at the wider institutional arrangement and functioning of the Science Shop. This case study design has permitted to retrace the interplay of these aspects of science shop practice that by now have been inquired rather separately. With respect to the general functioning of the Science Shop, the case study focuses particularly on the Science Shop's selection of community groups and demands to

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[1] I will use capital letters when speaking about concrete science shops and small letters when speaking about science shops or the science shop concept in general.

work with. Regarding the concrete community-based research processes to be studied, I have chosen such processes that the Science Shop considered particularly positive experiences, so that the processes could be assumed to be in line with the Science Shop's understanding of its wider mission. I have studied in detail one research process that dealt with local urban planning questions in a district of Copenhagen. I focus on this case as it offers possibilities of comparison with the project where I had been involved myself in Valencia, which dealt equally with urban planning. I have studied to a minor degree a second research process dealing with questions of carsharing in Denmark.

The data collection for this case study has been principally carried out during a three-month stay at the Science Shop in autumn 2007, although further data was also gathered afterwards. The employed methods were interviews, document analysis and observation (see appendix A for the list of interviews). So, during my stay at the Science Shop, I assisted to the staff meetings, had some insight into the Science Shop's functioning and its environment, and discussed with the Science Shop's coordinator also my theoretical approach. A meeting was held with a DTU research group working on urban ecology whose development is closely related to that of the Science Shop (see chapter one). I selected three research processes carried out between DTU students and community groups – as noted above, I have chosen later on to study only two of them: the third process showed to have taken place too long ago and its traces too difficult to follow. I consulted the archives held by the Science Shop that documented these three research processes, and I analyzed the corresponding research reports. I conducted in total twenty semi-structured interviews with the Science Shop's staff and with the participants in the three research processes: the students, their supervisors, the representatives of the community groups. I also interviewed a number of persons related to these processes. The interviews with persons linked to the DTU were held mostly in the office I was occupying during my stay or in the Science Shop's premises; those with persons not linked to the DTU were held in their respective premises; some interviews conducted after my stay were done by telephone. The interviews' duration was normally between one and two hours; all interviews were recorded (except one due to a technical failure) and transcribed. Throughout the thesis, the identities of the interviewees are kept anonymous.

In parallel to this analysis of the DTU Science Shop's work, the thesis provides a reflexive assessment of a project in Valencia, Spain, where I had been personally involved as one of its promoters. This project had been inspired by approaches of participatory action research (Villasante, 1993, 1994; Encina, Rosa and Caraballo, 2005). Started in spring 2006 and ended in

the beginnings of 2008, it had been conceived as a pilot project for a science shop at the Universidad Politécnica de Valencia (UPV). As mentioned above, such as one of the research processes facilitated by the DTU Science Shop it dealt with local urban planning; in contrast to the DTU Science Shop's process, the success of the experience has been under question. In my analysis, I follow the efforts done by the participants including myself of making sense of their project and their difficulties in doing so.

Other than on my own experience, my analysis is based upon the meeting minutes of the project team, the exhaustive email exchange between its members, and a large number of documents and materials generated during the process (see appendix B). The analysis includes equally the formal evaluation of the experience by its members, carried out some months after the end of the process, and an evaluation of members of the neighborhood association's board in a meeting I had with them about a one and a half years after the process had finished. Both evaluations were recorded and transcribed. The process is not documented by a research diary as recommended by action research scholars (McNiff, 1995; McNiff, Lomax and Whitehead, 2003), but I consider that the described data 'recorded' throughout the process provides largely sufficient material for analysis.

The research presented results from a travelling across frontiers - moving between different languages and different methodological options. I have assumed certain limitations deriving from such a research design in the light of its benefits. In my study of the DTU Science Shop's work I had to rely for instance mostly on English as a working language in conversation, although I was able to read Danish. As most Danish are fluent in English, this did not hinder to pursue the research objectives. On the contrary, my research design takes benefit from the study of an experience situated in the Danish cultural context assumed to be prone to public participation in science and technology (Fischer et al., 2004), in contrast to my own experience in Spain, a country where participation appears to be often rather instrumentalized (López Cerezo, Méndez Sanz and Todt, 1998).

Theory-building on the basis of an exploratory case study design requires to consider the particular contribution of each case and its units of analysis to the general argument made and to structure the thesis accordingly (Yin, 2003:154). This is what has been attempted here, as the following section will show.

STRUCTURE OF THE DOCUMENT

Chapter one serves as an introduction to the object of study. Giving an overview of the science shop movement and of the DTU Science Shop in particular, it provides the frame for discussing the democratic contribution of science shop work.

The first part of the chapter deals with the evolution of the science shop movement from its beginnings at Dutch universities to a broad diversity of science shops today. It presents the main democracy discourses to be found in and about science shop work, which show to be very much in line with the 'strong democracy' perspective on science shop work inspired by Richard Sclove's interpretation of Benjamin Barber's concept (Sclove, 1995). According to this perspective, the contribution of science shops to democracy relies on their role as *intermediaries* that make university R&D activities respond to the concerns of civil society groups. Furthermore, science shops are situated with respect to other devices for participation in science and technology.

The second part of the chapter describes the trajectory of the DTU Science Shop from an Interdisciplinary Center in the 1980s to its current institutional form of a 'science shop' today. I describe equally the parallel evolution of an urban ecology research group closely linked to that of the DTU Science Shop, in order to enrich the understanding of the Science Shop's development.

In **chapter two**, I start to discuss the democracy perspective mobilized in the DTU Science Shop's practice. This is done by an analysis of its selection of requests and community groups to work with. In the qualification of incoming requests, the Science Shop relies on a number of criteria, which are similar to those generally indicated in science shop literature. These criteria apparently transport a democracy perspective close to that of strong democracy. However, a closer look on the application of the criteria and its results allows a first critique of the strong democracy discourse on science shop work. The argument is made that this perspective comes short in explaining the observed practice. In contrast, this very practice points to an alternative perspective, that is developed drawing on Noortje Marres' work on the role of *issues* in democracy (Marres, 2005, 2007) and on actor-network theory. I suggest that it is not the support of specific social groups in their particular goals that defines the democratic effort of the Science Shop, but its interest in promoting the critical character of university R&D activities. The Science Shop's work may be understood as making university R&D participate in the 'public-ization' of the issues brought forward by community groups, that is, to the likely conflictive articulation of publics around them, and in their definition as a public affair.

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In order to extend the analysis to the Science Shop's promotion of specific community-based research processes, the chapter concludes with guiding questions for such analysis. These questions concern on the one hand the proper goals pursued in the collaborative research process, asking for the role of the attachment to a particular community group in the search of a wider articulation effort. On the other hand, the role of the Science Shop is questioned. Rather than as an intermediary whose task is basically one of connecting others and supporting them in their goals, this role may be conceived as that of an actively involved mediator.

Chapter three inquires from this perspective the DTU Science Shop's facilitation of collaborative research processes. It presents a detailed study of two research processes carried out between DTU students and community groups, focusing in particular on one of them that dealt with local urban planning in a district of Copenhagen. Following this process from definition to uses, the analytical potential of the perspective of issue articulation is outlined in contrast to that of the strong democracy perspective. The Science Shop shows not so much to be interested in a mere support of the community groups in their goals but in the promotion of a critical research on their issues. At the same time, the study shows that it is rather problematic to apply the issue-centered perspective for *evaluating* this aspect of the Science Shop's work: to judge whether process contributed or not to an articulation of the issue would require a standard of 'good' issue articulation; yet, such a standard appears to be itself at stake in our process. Equally, it shows to be problematic to make the step from understanding the Science Shop's role as a mediator to judge it in these terms. The Science Shop moves in fact in between the extremes of intermediation and mediation, that is, in between enacting its role basically as that of connecting and that of assuring the critical character of the research.

Chapter four takes the discussion of the value of the issue-centered perspective for analysis and evaluation further. It does so by discussing an experience where I have been personally involved: the action research process Taller de Barris, which dealt with participatory urban planning in Valencia and had been conceived as a pilot project for a science shop at the Universidad Politécnica de Valencia. In contrast to the process analyzed in the foregoing chapter, this one appeared to follow the ambitious goal of issue articulation: it aimed working collaboratively but critically with a neighborhood association on issues of their district. I offer an assessment of the process in the light of the main dimensions of the issue-centered perspective (that is, asking how far it was concerned with *issues* and their *articulation*, and asking what *role* its promoters played) and I situate this assessment with regard to the

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development of my own position to the research process and its evaluation. This allows to identify and discuss particularly the *uncertainties* associated to the application of this perspective for the evaluation of community-based research. While it allows to develop a rich picture of the complexity of the process and of the decisions taken in it, an application of these dimensions in terms of clear evaluation guidelines or criteria is not evident. In contrast, the interest of the perspective is shown to lie in its potential for discussing how science shop practice establishes and simultaneously problematizes such guidelines or criteria. Evaluation may then be understood from an angle of experimentation, participating in the definition and redefinition of the sense of science shop work.

The **fifth and last chapter** offers a synthesis of the theoretical argument developed in the foregoing chapters and proposes a *framework for evaluation*. Starting from a critique of what may be called a strong democracy perspective on science shop work, the dimensions of the proposed issue-centered perspective are clarified. The framework that is developed on the basis of this theoretical perspective assumes the need for operationalization at the same time as it recognizes the difficulty of doing so: it does not define clear evaluation items to be applied for external objective evaluation; in contrast, it invites to problematize science shop work according to the different dimensions of issue articulation and specifies nine 'axes of problematization' for doing so. It suggests (re)considering science shop work as experimentation on the uncertainties and challenges involved in its mission – a call directed both towards scholars concerned with participatory mechanisms in science and technology and towards science shop practitioners.

CHAPTER ONE. DEMOCRATIZATION, TECHNOLOGY AND SCIENCE SHOP

WORK: THE EXAMPLE OF THE DTU SCIENCE SHOP

INTRODUCTION

An official definition of science shops characterizes them as an entity that "provides independent, participatory research support in response to concerns experienced by civil society" (Gnaiger and Martin, 2001:6; Mulder, Jørgensen, Pricope, Steinhaus and Valentin, 2006). When reading through the literature on science shops, we learn soon that in spite of their name they are actually neither 'shops' nor is 'science' to be understood exclusively in terms of *natural sciences* (which is how 'science' is usually understood in English): science shops usually offer citizen groups "free or low cost access to scientific or technical knowledge which will help them to achieve social or environmental improvement", and they "use the term science in its broadest sense, incorporating social and human sciences, arts, as well as natural, physical, engineering and technological sciences" (Mulder et al., 2006:279). As promoting *community-based research* (CBR), which is "inherently interdisciplinary" in nature (Strand et al, 2003:138), science shops in fact challenge such disciplinary categories.

Science shops appear to be a somewhat different model of the well-known technology or knowledge transfer offices, promoting applied research with other groups than the usual ones (i.e. from industry and business). The difference to such transfer offices is central to science shops, as Gnaiger and Martin (2001:6) emphasize:

"What distinguishes science shops and CBR organisations from traditional knowledge transfer facilities is their commitment to participatory methods. Much of the research produced by science shops is in direct response to the expressed needs of community organisations. Such research therefore reflects the concerns of civil society rather than the interests of researchers, academic institutions or private companies".

Since the distinctive feature is to work with community organizations in a participatory way, we need to examine what is meant by a 'community organization' and what is considered as

'participation'. The definition of what 'community' would mean differs within science shops, but usually three criteria are cited that define their 'clients'[2]:

"The first one is that the clients should have no commercial aims and that the research results must become public. Second, clients must be able to use the results of the research to achieve their mission (…). Third, the clients must not otherwise have the (full) financial (and/or scientific) means to acquire their research (or they should finance part or all of the project)"[3] (Mulder et al., 2006:279).

In practice this translates to groups such as trade unions, pressure groups, non-profit organizations, social groups, environmentalists, consumers, residents associations and alike[4]. The form of participation may be very different according to the particularities of the research question and the resources available. In general it is considered a basic component the joint definition of the research question, which gives then place to a varying degree of involvement of the community group in the research process itself.

Today, science shops are to be found all over the world, connected through the international Living Knowledge network. Their number is however difficult to determine due to the ambiguity that the concept of science shops has gained over time as a result of the important spreading of the concept across the world (that I will describe in some more detail in section 1.2.). In the Netherlands, origin of the science shop movement, in 2006 "over 30 shops" were

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[2] The term 'client' is sometimes used in science shop literature to describe the community partners in the CBR. This is not only in line with the commercial connotation of the name 'science shop' but also seems to be an easy reference which for instance allows referring to both groups and individuals in contrast to notions such as 'community organization', 'community group', 'civil society organization' and alike (although only some science shops accept requests from individuals). However, I will prefer other notions during the text, primarily that of 'community group', asking the reader to pardon the insufficiency of the notion to capture the wide range of identities that come to collaborate with the DTU Science Shop.

[3] Very similar criteria are given cited by Irwin, 1995, and Farkas, 2002. Another definition of what the "community" in CBR would be has been suggested by Strand et al. (2003:3): "*Community* in this context includes educational institutions (schools and day care centers), community-based organizations of various kinds (neighborhood associations, for example), agencies that provide services or otherwise work on behalf of area residents (such as a local health department of battered women's shelter), or groups of people who may not share a geographical association but do share an interest around cultural, social, political, health, or economic issues (for example, unions, Latinos, ex – offenders, breast cancer survivors, and identity groups such as the Gay, Lesbian, Bisexual and Transgender Alliance). Sometimes the focus is on a local problem facing a neighborhood or an organization. The focus can also be regional, national, or global. In every case, the community consists of people who are oppressed, powerless, economically deprived, or disenfranchised – that is, who are disadvantaged by existing social, political, or economic arrangements".

[4] As we can read in the flyer of the Living Knowledge network, available in an electronic version at http://www.scienceshops.org/new%20web-content/content/documents/ISSNET/LK_flyer.pdf

counted (Mulder et al., 2006:281), in Europe in 2001 more than 60 science shops (E.C., 2001)[5]. Today, the International Science Shop Contact Point counts science shops in at least 28 countries worldwide, and the Living Knowledge database[6] lists today 63 organizations that cover 35 thematic areas[7]. Concerning the quantity of requests dealt with and CBR projects done in science shops, variation may be assumed to be high, which can be as much as 300 requests and 112 projects per year, as we find in the 2001 SCIPAS report (Gnaiger and Martin, 2001).

In this chapter, I will give an overview of the science shop movement's history from its emergence in the Netherlands to the building up of an international network. I will discuss briefly the diversity of science shops that this development has produced. A claim of science shops from their beginnings until today has been their contribution to the "democratization of science" (Wachelder, 2003) or to the "democratic governance" of science and technology (Jørgensen et al., 2004): I will characterize the most visible democracy discourses about the movement and present within it and situate science shops with respect to other forms of participation in science and technology. I will finally introduce the reader to the Science Shop[8] of the Technical University of Denmark, in order to provide the basis for the analysis of its work in the following chapters. I will describe its trajectory during its more than 20 years of existence and its perspective on democracy. Finally, I will briefly describe the trajectory of a particular teaching and research unit at DTU specialized in urban ecology, because of two reasons: first, its development is related to that of the Science Shop, and second, one of its members was involved in the CBR process analyzed in chapter three of this thesis.

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[5] This second number has been referred to also in more recent documents as for instance in Wachelder (2003) and Leydesdorff and Ward (2005), although it may be assumed to have changed since 2001 due to the growth of the movement and the transformations and closures of existing science shops.

[6] The database, which can be consulted on the Network's website, gives an overview of the science shops that form part of the network concerning their geographic distribution and organizational form and the areas they work in.

[7] This data has been provided in my personal communication with the coordinator of the International Science Shop Contact Point.

[8] I will refer in this document to science shops as a general concept by using small letters and to particular institutions by using capital letters.

1. THE SCIENCE SHOP MOVEMENT

1.1. *Origins and development of the movement in the Netherlands*

The science shop movement has its beginnings in the early 1970s in the Netherlands[9]. It was born "[i]n the wake of the tumultuous students' protests of the late 1960s, [when] many volunteers, mainly students and ex-students, tried to open up the Dutch universities to social groups that until then had had no access to scientific knowledge" (Wachelder, 2003:252). The goal of the movement was to transform 'bourgeois' science and its institutions, building on radical leftist ideas and being informed and supported by the "young STS movement", that is, the developing field of Science and Technology Studies. This transformation, sometimes referred to as the 'democratization of science', was meant to change the way scientific knowledge was produced, disseminated and applied, and was meant to be achieved through the promotion of interdisciplinary, project-oriented work in response to - and in collaboration with - social groups. Such social groups were "unions, targeting issues such as occupational health, social security, and working conditions; environmentalists; patients' groups; third-world activists; and, slightly later, women's liberation groups" (Wachelder, 2003:253, references removed).

The first science shops emerged at the University of Utrecht and the University of Amsterdam in the 1970s. The idea spread and the number grew, and by 1987 "each Dutch university housed at least one science shop" (Wachelder, 2003:254). Over time, the initially rather loose link of these shops to the university became stronger. This happened thanks to the trend to foster a more democratic organization of universities, the support received by many academics, and the fact that Dutch universities, being public, received by the early 1980s special state funding for social services to be provided by universities (Wachelder, 2003). Subsequently, Dutch science shops became fully financed by their corresponding universities (Mulder et al., 2006).

It was partly this integration into the university that, according to Wachelder, led many science shops to become less radical over time. He gives two more reasons for that, one being the

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[9] The idea itself dates much earlier and it may in fact be rather difficult to determine its exact 'date of birth': Henk Mulder of the Science Shop for Chemistry at the University of Groningen identified as the science shop's forerunner the *boutiques de droit* in France which existed already in the end of the 19th century (cited in Wissenschaftsladen Bonn, 2004). Lascoumes (1978) retraces in turn the origins of these *boutiques de droit* back to the English *law shops* and the Flemish *westfinkel*, which he describes on their part to draw from the *settlement houses* and *neighbourhood centers* emerging from 1873 on in England.

frustrating experience that the desired impact on the universities' research agenda was poorer than envisaged. Science shops "failed to redirect the universities' research priorities", Wachelder argues, citing two texts authored by members of different Dutch science shops (Zaal, 1987, and Bökkerink and Weerdenburg, 1991). The other reason was the decline of the "popularity of the leftist political convictions of the 1960s and 1970s" (Wachelder, 2003:253; 254). So while some science shops continued to be student-run and loyal to their origins, the larger part professionalized to becoming 'intermediaries' between 'clients' and students and/or researchers. This had consequences for the kind of groups that science shops collaborated with, as the professionalization of the science shops brought with it the widening or change of the spectrum towards less grassroots-based groups - a critical question which became a topic of discussion in the national association of science shops (Wachelder, 2003:254). The professionalized model has dominated in this bifurcation in such a way that Mulder et al. (2006) come to describe in their account of the Dutch science shops' history this 'professionalization' as a generalized feature of the movement's development process.

1.2. *Spreading to other countries and building up the Living Knowledge network*

From the 1980s onwards, the concept spread to other European countries and beyond. This success is partly attributed to the good publicity made by science shop practitioners and interested scholars: articles about the concept in journals such as Nature (Ades, 1979) and Science (Dickson, 1984) "triggered much attention abroad", whereas "[p]ublications by Leydesdorff (1980) and Nelkin and Rip (1979) further clarified the benefits" and the book written by Sclove (1995) served to make the link to the US CBR movement (Mulder et al., 2006:281).

The descriptions of how the concept spread vary[10]. Following a recent account (see figure 1.1), starting from the science shop movement in the Netherlands and also from the CBR movement in the U.S., in the 1980s science shops evolved in a number of European countries such as Germany, France, Denmark, England, Northern Ireland, Belgium and Austria as well as in Australia (Jørgensen, 2008), which were however not all successful (as was the case with the French, the English and the Australian experience, Mulder, Auf Der Heyde, Goffer and Teodosiu, 2001; Amiot and Marsal, 2004). In the 1990s and the following decades, science

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[10] Other accounts are given for instance by Mulder et al. (2006), Fischer et al. (2004) and Farkas (2002).

shops emerged in more European countries and also beyond; also in those countries where the first attempts had failed, new initiatives appeared and some managed to stabilize.

Figure 1.1. Overview of the spreading of science shops according to Jørgensen (2008; PowerPoint presentation made at the Universidad Politécnica de Valencia)

The growth of the movement responded to different circumstances and discourses, and happened according to "four waves" (Fischer et al., 2004). The first, still exclusively Dutch wave, was marked by a strong motivation for the democratization of science both visible in the science shop's discourse and, more generally, within the political climate. During a second wave in the 1980s, the emergence of science shops in Germany, France and Denmark showed a strong influence of the environmental movements and the "Bürgerinitiativen" (citizens' initiatives). Fischer et al. describe then as a third wave the "revival" of the concept during the 1990s due to the "increasing awareness of the gradual replacement of the industrial economy by a knowledge-based economy". The science shops' development profited from the then appearing 'mode 2' concept (Gibbons et al., 1994) with the associated normative claim for a "new social contract of science" and a corresponding new role for the university (Gibbons, 1999; Nowotny et al., 2001)[11]. In this third wave the European Commission became a

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[11] The mode 2 concept, introduced by Gibbons et al. (1994) and refined in Nowotny, Scott and Gibbons (2001) and Nowotny, Scott and Gibbons (2003), characterizes a new mode of knowledge production in contrast to "mode 1", which stands for the ivory-tower science, distanced and protected from society. The characteristics of "mode 2"

supporting force of science shops. The fourth wave was characterized by the extension to Middle and East-European accession countries (Fischer et al., 2004).

Facing the considerable growth of the movement, organized networking between science shops became a topic in the late 1990s. It was in 1999 that the first move towards the creation of an international network was made, when during an encounter in Austria "science shop coordinators from Germany, Austria, and the Netherlands met to discuss their own work and possibilities for future collaboration" (Farkas, 2002:23). Several European projects were of importance in the establishment of the network. A first one aimed at the 'Study and Conference on Improving Public Access to Science through Science Shops' (SCIPAS). The project, led by a consortium of science shops from the Netherlands, Denmark, Northern Ireland, Germany, Israel and South Africa, as well as the Loka Institute in the United States, started in 2000 and investigated during two years a number of different aspects central to science shops' performance and future development. On the basis of the study's results, by the end of 2001 seven reports were issued[12].

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are: 1) knowledge is generated within a context of application; 2) the trans-disciplinarity of knowledge production (not only across disciplinary boundaries but also beyond disciplines); 3) a much greater diversity of the sites at which knowledge is produced and in the types of knowledge produced; 4) an increased reflexivity, and 5) novel forms of quality control (Nowotny et al., 2003). The concept is primarily understood by the authors as a descriptive and analytical one, but has given space also for normative claims such as that for a new social contract of science made by one of the authors: Whereas "[u]nder the prevailing contract between science and society, science has been expected to produce 'reliable' knowledge, provided merely that it communicates its discoveries to society", a new contract should "ensure that scientific knowledge is 'socially robust', and that its production is seen by society to be both transparent and participative" (Gibbons, 1999). As for the role of universities in this new mode of knowledge production, the "transgressivity" of knowledge production makes university at the same time "capture" the loci of knowledge creation and be "captured" by them. Universities confront with this the challenge to cope with a process of "de-institutionalization", where the boundaries between "inside" and "outside" are blurred due to the increasing distributedness of knowledge production. In contrast to the (always questionable) role of university in mode 1 as an autonomous and distant site of knowledge production and dissemination, separated from its cultural role, mode 2 produces the convergence of its scientific and social role (where the "scientific role" refers to its research and teaching functions). Universities have to find here the right synergies between their different functions: between teaching and research on the one hand, and between the scientific and the social function on the other. At the same time as university is adapting to change and needs doing so, the "mode 2 – university" continues to fulfill two functions "that depend on it being a relatively stable institution": 1) "It remains the most important incubator of the next generation of researchers", and 2) it remains also a "generator of cultural norms" (Nowotny et al., 2001:91-93).

[12] The seven SCIPAS reports are: "Operational options" (Gnaiger and Martin, 2001), "Success and failure in starting Science Shops" (Mulder et al., 2001), "Training programmes for science shops" (de Bok, 2001), "The development of an international science shop magazine" (Steinhaus, 2001), "Development of a public Internet database of science shops" (Chopyak, 2001), "The impact of science shops on university curricula and research" (Hende and Jørgensen, 2001), "Living Knowledge: the network. Accomplishments and further opportunities for developing an international network of science shops" (Lürsen and Sclove, 2001).

In January 2002, a second two-year project started. INTERACTS ('Improving Interaction between NGOs, Universities, and Science Shops: Experiences and Expectations') was "a pioneer cross-national study" that was led by a slightly different consortium, including this time organizations and institutions from Austria, Denmark, Germany, the Netherlands, Romania, Spain, and the United Kingdom. The project had as its aim

> "to contribute to improved interaction between NGOs, universities and Science Shops by providing information on the experiences and expectations of co-operation between small and medium NGOs and universities through intermediaries such as Science Shops. The project should be seen as a contribution to the discussion of strategies for democratic governance." (Jørgensen et al., 2004:3)

This was to be achieved by an in-depth study of science shop practice that should allow "a broader picture to emerge concerning past experiences with impact of Science Shops, future expectations and policy relevance" (idem). It consisted of case studies of science shop projects in each participating country[13], a broad scientometric analysis, participatory workshops for "allowing discussion of future expectations and perspectives for co-operation with NGO representatives, researchers and policy makers", and an analysis of "the political and institutional conditions" in the different countries – objectives that are documented in the different reports produced by the consortium[14].

INTERACTS was an "accompanying measure" to ISSNET, the Thematic Network preparing the future International Science Shop Network that started in March 2003 and received funding for two years. Building on SCIPAS and being developed almost in parallel to INTERACTS, ISSNET wanted to "establish a new vibrant and sustainable International Science Shop Network" in order to share "the expertise of existing science shops and support for the development of new science shops"[15]. It was funded within the activity Raising Public Awareness of Sciences and Technology of the Fifth Framework Programme of the European Commission and was

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[13] In Spain, the three following institutions or initiatives figured as cases: *Pax Mediterranea*, *Arquitectura y Compromiso Social*, and the *Instituto Sindical de Trabajo Ambiente y Salud* of the union Comisiones Obreras (Ahumada and Labatut, 2003) – the first a newly created science shop and the second and the third entities with already some trajectory in projects similar to science shop work.

[14] The reports produced, available at the projects website http://members.chello.at/wilawien/interacts/main.html, are: a state of the art report (Fischer and Wallentin, 2002), a scientometric report (Leydesdorff and Ward, 2003), country reports on the cases studied, reports on the participatory workshops in each country, and a final report named: "Democratic Governance through Interaction between NGOs, Universities and Science Shops: Experiences, Expectations, Recommendations" (Jorgensen et al., 2004).

[15] http://www.scienceshops.org/new%20web-content/content/about-ISSNET.html

carried out by a consortium of 13 organizations from nine countries. The growth of the *Living Knowledge Network* took place both through the creation of new science shops and the establishment of links to existing initiatives and networks with similar goals, both in Europe and in other continents. In this regard, the network deepened its connection to the CBR tradition in the United States. In Canada, from 2000 onwards the "Community-University Research Alliances" (CURA) had been modeled following the Dutch science shop example (Mulder et al., 2006).

It was with a project for providing support for the creation of new science shops and the strengthening of existing ones that the network received once again financial aid from the European Commission. The project 'Training and Mentoring of Science Shops' (TRAMS), a 36 month Coordination Action funded within the 6th Framework Programme of the European Commission, sought on the one hand to "encourage the development of emergent science shops through the provision of training and mentoring support", and on the other, to "support the ongoing professional development of existing science shops and similar organisations through the sharing of training materials and the experiences from daily practices to update professional development"[16]. The project's consortium, having increased to include 18 organizations from 14 countries, developed "1) a mentoring programme for science shops, 2) training materials and programmes, 3) E-modules and E-learning tools, [and the] 4) dissemination of training and mentoring activities" (Wissenschaftsladen Bonn, 2006). Under the guidance of the 'old' science shops, the establishment of new ones was supported in countries such as Iceland, France, Greece, Spain[17], Turkey and the Baltic States (Mulder et al., 2006). The training materials produced through the project have been made available on the network's webpage[18]. In January 2010, the network's next European project will start. This project, named PERARES (Public Engagement in Research and Research Engagement with Society), has as its aim to "strengthen interaction in formulating research agendas between

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[16] http://www.scienceshops.org/new%20web-content/content/about-TRAMS.html

[17] The Spanish participant in the TRAMS consortium was CREA (Centre of Research in Theories and Practices that Overcome Inequalities) of the University of Barcelona. It is today one of the four Spanish entries in the science shop database, at the side of the CEES (Centro de Estudios Ecosociales) at the University of La Laguna, Tenerife (for an overview of the CEES see: de Cózar, 2004; de Cózar and Sánchez García, 2008); the International Economic Institute (University of Valencia); and the UPC Enresa-Enviros Chair of Sustainability and Waste Management.

[18] http://www.scienceshops.org/new%20web-content/framesets/fs-toolbox.html

researchers and Civil Society Organisations (CSOs) in Europe". This strengthening is to be done by linking existing "debates on science" to research institutes to work on them[19].

The efforts to maintain and spread the concept of science shops are marked by the consciousness that new science shops need to find their own solutions tailored to their particular local circumstances. The limitations of such an adapted transfer are important - science shops are very Dutch, as Wachelder's reference to the Dutch "polder model" clarifies:

> "An important part of the [polder] model is wage restraint, the outcome of fairly harmonious bargaining efforts and subsequent agreements between unions and employers' organizations that require endless deliberation, consultation, and monitoring before a consensus is reached. This process in turn requires a host of councils and institutions that mediate between the various interest groups, thus softening the rough edges of the market economy. In some ways, science shops provide an excellent example of this same phenomenon." (Wachelder, 2003:252)

In this sense, Felt, Erlemann and Fochler (2003) have analyzed the difficulties of establishing science shops in Austria, and point to the difficulty of actually transferring "a well working model from one context (and time; namely in the Netherlands and the 1970's) to another cultural context and another period in time" and to the "importance of adapting imported models in a way that they become suitable to the concrete cultural context (which could even be a local one in the strictest sense)" (p.7).

Despite this limitation of the possibilities of transfer, the Living Knowledge Network today is well established and still growing, as the database of science shops on its website reveals. This is partly to be attributed to the continued support of the European Commission, who apart from funding the described projects also issued a brochure on science shops (E.C., 2003) and even dedicated a specific call to science shops in FP6 where science shops could present European projects (FP6-2005-Science-and-society-20). The network organizes biannual conferences[20] which are strongly practice-oriented but show an increasing presence of theoretical reflection (Worthington, 2007). It furthermore makes itself visible through

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[19] PERARES abstract, personal communication with the coordinator of the International Science Shop contact point (12-10-2009).

[20] The first conference took place in Seville, Spain, in 2005, a second one in 2007 in Paris, and a third one in Belfast, 2009. This last conference counted with 180 participants from 17 countries.

publications, which are mostly written by a "core" group of the movement, including Caspar de Bok, Henk Mulder, and Michael S. Jørgensen[21].

However, at the same time as the science shop movement has been growing and established itself as a stable international network, the existing science shops had to face increasing difficulties to maintain their position from the 1990s onwards. This affected the early importers of the concept such as for instance Germany and Belgium but also the well-established science shops in the Netherlands, where a considerable number has been closed down: "[i]n 2000, it was no longer true that each Dutch university housed a science shop" (Wachelder, 2003:255); most recent menaces were experienced by the Groningen science shops in 2008. The arguments used for justifying these closures referred not so much to a possibly poor performance of the science shops but to "inevitable, university-wide budget cuts" (idem) or to science shop work not being the "core business" of the university (Kamphuis and Scheepstra, 2008). Wachelder gives a comprehensive account of the circumstances accompanying these closures in the Netherlands:

"Broadly speaking, in the 1990s, the Dutch political climate moved in a more conservative direction. The government gave universities greater autonomy over their budgets, whereas the university boards' power increased at the cost of the democratically elected university councils. Moreover, the universities were confronted with declining state funding, as a result of which many boards went after additional research funding. In so doing, they favored community-based activities that generated funds rather than producing costs. Increasingly, universities began to sell services to commercial partners. Furthermore, as an effect of the changing political climate, the predominantly leftist attitude among students grew weaker in the 1990s. They were also subjected to a much stricter academic regime when it came to passing exams or receiving grants and scholarships; the tighter schedules of students left them less time for involvement in science shop projects. For staff members, the pressure to publish significantly increased during the 1990s, which caused many of them to be more reluctant to engage in science shop projects. As for their clientele, it is clear that many activist or grassroots groups evolved into much more professional organizations that appointed their own experts. In this way, these organizations gained expertise for solving relatively simple problems on their own, while they also increasingly received funding to pay

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[21] Recent publications are the chapter on science shops by Mulder, Jørgensen, Pricope, Steinhaus, and Valentin in the book "Interfaces between Science and Society" edited by Â. G. Pereira, S. G. Vaz and S. Tognetti (2006) and an article of De Bok (2002/2003) in the CBR journal Pragmatics.

for more complex or more professional research." (Wachelder, 2003:255/256, references removed)

The overview of the science shops' history shows that the growth of the movement went hand in hand with the adaptation and diversification of the science shop concept. This was due to two major causes: on the one hand, to the difficulties of survival of the established science shops (Wachelder, 2003); on the other hand, to the fact that the 'transfer' of the concept to other countries and circumstances encouraged the development of new models (Leydesdorff and Ward, 2005). With this it becomes increasingly difficult to draw a clear picture of what a 'science shop' actually is today. The existence of the international science shop network may help forging a common identity among its members in spite of their diversity. This is yet not at all self-evident: not only does the name pose difficulties as many network members actually consider it rather misleading due to its connotation of market exchange and of exclusively dealing with natural sciences as I have mentioned earlier. Also the ways of collaboration within the network have been a matter of debate among its members: it has for instance been questioned whether *international* CBR projects such as those supported by the European call for science shops projects go together with the "grassroots orientation" of science shop work[22].

In order to be able to situate my discussion of the DTU Science Shop's work in the broad panorama of the science shop movement, I will discuss in the next section different intents of classifying their variety.

1.3.   An attempt of classifying the diversity of science shops

Describing, characterizing, and understanding the variety of science shops is a recurrent preoccupation in the scarce literature on science shops, as exemplified by the "kaleidoscope" article by Leydesdorff and Ward (2005). Out of the different categories applied in order to classify the variety of science shops, I will give an overview of the most commonly used.

One such category is the relationship to the university. In their SCIPAS report, Gnaiger and Martin (2001:6) distinguished "between two main models of science shops: those which follow the Dutch model and are university based and those which are not based in a university. The second type can be further divided into those which have a relationship with a university, those without such a relationship and those which act as incubators for establishing a science

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[22] This was discussed in the workshop on science shops in spring 2005 (E.C., 2005) and has also been commented by Fischer et al. (2004).

shop." As for the university-based science shops, we can moreover differentiate between centralized and decentralized (faculty-based) ones (Farkas, 2002). A centralized science shop forms in general part of the university's administrative apparatus and offers its services to the whole of the faculties and departments of the university. A decentralized science shop is usually located at a particular faculty or department and is specialized in the corresponding academic field.

Concerning the disciplines covered, the science shops' database gives an idea of the wide range of fields addressed (see figure 1.2). While Irwin (1995) and Zaal and Leydesdorff (1987) detected a prevalence of social science issues, today the list seems to be rather extensive, ranging from the humanities and social sciences to technical fields.

Agriculture	Law
Animal	Public Health
Forestry	Diseases
Plant	Medicine
Production	Risk assessment
Economics	Risk communication
Education	Social welfare
Environment	Employment
Cleaner production	Gender
Nature	Migration
Waste management	Technology
Water management	Biotechnology
Humanities	ICT
Culture and arts	Nanotechnology
Ethics	Urban Planning
History	Spatial planning
Language	Traffic and transport

Figure 1.2. The disciplines listed in the science shops' database. Source: DTU Science Shop

Differences can also be found in the goals that science shops pursue. Among the three university functions that science shop work involves - outreach[23], education, and research - most science shops want to cater for the first and the second one, whereas the goal of influencing research policies is in general secondary to most science shops (Fischer et al., 2004).

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[23] 'Outreach' or 'knowledge transfer to society' are the notions used by the LK network and in US CBR for referring to the 'third' mission of universities beside teaching and research, that emphasizes the effort made by university to connect to 'society' (see http://www.scienceshops.org/new%20web-content/content/faq-3.html; accessed October 2009). As the reader will see throughout the research, this concept is very wide and different ideas may be related to outreach, as for instance that of counteracting the 'ivory tower' position of university research or contributing to the 'public good'.

As we have seen before, science shops differ also in the kind of community groups they work with. The three criteria (a non-commercial aim, the lack of resources, and the capacity of using the results) described in the beginning of this chapter do not seem anymore to be applicable to all science shops. In any case, science shops show to be flexible in the way they interpret the criteria: they may be often "a rhetorical tool for communicating science shop's purposes rather than a set of commandments" (Farkas, 2002:68). In this sense, whereas in the beginning projects were free of charge, today many science shops accept or demand payment of the community groups so that the community groups not necessarily need to lack the resources as one of the criteria holds:

> "… by the end of 1980s, it was no longer expedient to limit questions to groups who could not pay for the research. Many organizations who were pursuing social change had money—refusing questions on the basis of ability to pay would force the science shop to ignore a whole sector of questions that were potentially very interesting to researchers and students" (Farkas, 2002:68).

This change may be related to the fact that science shops increasingly have had to find their funding outside the university. This affected the conditions under which they could work with community groups but also the organizational design of science shops, so that for instance Interchange, the science shop at the University of Liverpool, was organized as a charity organization so that it could apply for funding for its research projects (Hall and Hall, 2007:142).

Similarly, the criterion of a non-commercial use is today maintained by some science shops while others also accept commercially-oriented requests. The criterion that the community group should be able to use the results means in general that it should have the stability and resources for doing so. In this sense, "most science shops will only work with individuals if they can ascertain the research might have implications for a broader audience" (Farkas, 2002:92) – but also here we find exceptions, as for instance the Eindhoven Science Shop that works on the very particular needs of handicapped persons.

The literature documents furthermore a bifurcation between those science shops where the projects are primarily carried out by students and those where research is done more professionally, either by faculty members or by professional researchers. Accounts differ here as to which model was the initial one. On the one hand Wachelder describes carefully the development from students-run science shops (where the projects are carried out by students) to a variety of models of which some rely on students' labor and others not. Farkas (2002),

similarly to Sclove (1995), puts it the other way around. She describes the change from the initially faculty-led research to the nowadays existing variety of some science shops relying on students' labor and others professionalizing the research:

"Science shops had a difficult time adjusting to the realization that community problems do not present themselves as 'ready made' research questions. Some responded by shifting focus towards getting students rather than scientists to do research for community groups as part of the regular academic curriculum. This necessitated fleshing out the position of a professional intermediator. Mediators could spend time transforming a client question into a student research project and even adapt it to different disciplines depending on the student researcher. A few science shops took a different direction altogether, choosing to work more with scientists or professional researchers to steer their fields far beyond what is possible using student research. In general, science shops are more successful at getting students to take on research rather than scientists or professional researchers." (p.209)

As a more complex classification, Wachelder sought to typify the different models of science shops that evolved from the original, rather homogeneous, model of a student-run organization only loosely attached to university. Adapting to the changes in the university and in the relationship between science and society over time, Wachelder characterized four models of adaptation with respect to the Dutch science shops: "a nonprofit service provided by students", "a specialized, market-oriented research center and consultancy", "a university public relations tool", and "a professional broker mediating between science and society" (Wachelder, 2003:258-261). The categories for such a classification were the kind of services provided, the internal organization, the place in the university organization, and the kind of groups served, where he observed the following options:

- Key activity of science shop staff: brokering, mixed, research;
- Main staff positions held by: students, mixed, professionals;
- Formal position in the university: loose, neutral, strong;
- Clientele: deprived groups only or more generally "social groups".

Another classification developed for U.S. CBR structures attains the degree of complexity in the organization of the CBR structure, where four models are described: the "solo practitioner model", the "simple CBR structure model", the "complex CBR Center Structure model", and the "metropolitan consortium model" (Strand et al., 2003:169,170).

Last but not least, as Wachelder noted for the Dutch science shops and as I may extend here to the science shop movement as a whole, the variety of science shops existing today entails an equally wide range of *perspectives on the sense of their work*. Radical leftist perspectives based on authors such as Marx, Illich and Goerz are cited by Wachelder for the beginnings of the Dutch movement; the influences of popular education, action research and participatory research practice and theory are cited as being the fundaments of the CBR movement in the U.S. (Strand et al., 2003). Different STS perspectives are present not only in some texts about science shops (explicitly referred to for instance in Farkas, 2002, and Wachelder, 2003), but also in their practice (as for instance at the DTU, see section five), and many other perspectives are drawn upon to reflect on science shop work[24]. In the next section, I will give a brief account of the way ideas of democracy are mobilized in the literature and in the "official" discourse of the movement[25].

2. SCIENCE SHOP WORK AND THE DEMOCRATIZATION OF SCIENCE AND TECHNOLOGY

2.1. *Perspectives on science shops and democracy – the strong democracy discourse*

The democratization of science has been an "avowed aim" since the beginnings of the science shop movement (Wachelder, 2003:244). The interest of science shop work in, concern with and relation to, democracy issues has been invoked and widely discussed in the literature on science shops, both by STS scholars and practitioners – who had been closely linked in the early days of the movement as we had pointed out before.

The theoretical justification of science shop work in terms of democracy relies usually on the perspective of "strong democracy" (Barber, 1984)[26]. This perspective has been first applied to

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[24] The diversity of perspectives seems not only bound to the different circumstances and challenges that science shops confront as described by Wachelder but also to the disciplines touched: In this sense, we find in literature about CBR mostly in social sciences the definition of CBR as "research that is conducted *with* and *for*, not *on*, members of a community" (Strand et al., 2003:xx). The problematic relationship between social researchers and the community addressed here, where the community often serves as a mere object of study, is a topic rather specific to social research which is probably not found as such in research in technology or natural sciences. The sense that CBR is given seems to be thus in part dependent on disciplinary particularities.

[25] I refer to the 'official discourse' as the perspectives expressed in those documents issued on behalf of the science shop movement, as for instance Mulder et al. (2006) or the general descriptions available on the webpage.

[26] This is the case with some publications by science shop practitioners such as Jorgensen et al. (2004), and Mulder et al. (2006).

community-based research and science shops by Richard Sclove (1995). It has also been employed by Bijker under a social construction of technology perspective[27] (1996) and by Strand et al. for CBR in general (2003:25/26,149). According to Sclove's influential interpretation, strong democracy suggests an approximation to direct democracy by giving in decision making "special weight to local communities as foundation" (Sclove, 1995:40). It is then the involvement of these local communities into science and technology and the strengthening of their role that science shops may contribute to.

This perspective has impregnated the discourse of and about science shops: science shops are seen as contributing to the representation of underrepresented interests of civil society by supporting those groups that represent these interests best[28]. The integration of these groups in the making of science and technology would simultaneously make research and innovation respond to the needs of those groups and help redirecting the research and development agenda to societal goals[29]. Expressions of this perspective in science shop discourse are for instance the following: that the 'empowerment' of community organizations would be a service to democracy as these groups represent the concerns of civil society with regard to environmental and social goals (Jørgensen, 2005); that science shops are 'intermediaries' that give 'access' to scientific resources to those who normally don't have that access (Leydesdorff and Ward, 2005; Jørgensen, 2005); and that science shops influence science and technology this way, by "orienting traditionally elitist academe towards social needs" (Farkas, 2002) thanks to their 'demand-driven' approach (Teodosiu, Brodersen and Jorgensen, 2005; Mulder et al., 2001). Science shops promote "equitable and supportive partnerships" between the university and the community - a "symbiotic relationship" that benefits all sides (Mulder et al., 2006:278,279). The question of the democratic quality of science shop work is also sometimes presented as one of the degree or quality of participation by the community group in the

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[27] The SCOT approach was introduced by Wiebe Bijker and Trevor Pinch (Pinch and Bijker, 1984). It is at the side of actor-network theory the most prominent STS approach on technological innovation. While both are constructivist approaches, SCOT emphasizes the fact that technology is a product of social processes whereas ANT prefers to understand the constructivist program beyond the distinction of society and technology, nature and society, or facts and values (Latour, 2005).

[28] A closer analysis of this perspective and its implications for science shop work is given throughout the chapters of this dissertation, so that a brief outline may prove useful at the same time as I refer the reader for its extensive discussion to the next chapters.

[29] The goal of influencing research and development has been according to Wachelder part of the science shops' agenda from the very beginning, although some authors describe it as a later ingredient (Worthington, 2007) or don't mention it at all (Fischer et al., 2004).

research process – the more participatory the process is, the more democratic it should be considered, the common argument runs[30].

However, much reference to, or discussion of, science shops in terms of democracy has tended to treating science shops as a homogeneous and well known practice[31]: none of these two assumptions is justified, as we have seen before when discussing the diversity and change in the science shop movement. The diversity of science shops and the growing academic work about participatory procedures in science and technology suggest the need for rethinking our current understanding of science shops by carrying out more thorough empirical analyses, avoiding inappropriate simplifications and taking their variety into account. This point has been made by Wachelder (2003)[32] on the basis of his analysis of the evolution of Dutch science shops from a perspective of "classic liberal democracy", where he showed that Dutch science shops today show very different democracy perspectives according to their different ways of functioning. I would further add that such reflection may particularly benefit from recent discussions on democracy situated at the crossroads of STS and political philosophy, as developed in this thesis.

The INTERACTS study described earlier, promoted by the science shop movement itself, has intended to remedy the lack of empirical research on science shop work. The study aimed at offering conclusions about the contribution of science shops to "democratic governance" as the final report's title makes explicit[33] (Jørgensen et al., 2004). Such theoretical analysis should be made possible by an empirical design providing a broad and exhaustive study of science

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[30] This argument seems to be also contained in Farkas' (2002) classification of science shop work in three models of "democratizing expertise" (representative model, engagement model, partnership model): these models point to different aspects of science shop work, that of representing citizen interests in scientific arenas, that of scientists getting engaged in political arenas, and that of making the production of knowledge itself a shared enterprise. The three models are not to be found as such in science shop practices, she rather describes different modes of practice that may and do often coexist and produce tensions between each other. But also Irwin, Bijker (according to Wachelder) and critiques from US CBR (Strand et al., 2003) judge science shop work in a similar way according to the degree of partnership in the research process.

[31] Recent examples are the chapter about public participation in science and technology in the third edition of the Handbook of Science and Technology Studies (Bucchi and Neresini, 2007) and the discussion of science shops given by Douglas (2005).

[32] Wachelder puts his critique like this: "It seems justified to point out, though, that by and large, Dutch science shops reflected little on the ideological implications of their organizational adaptations" (p.257); "[c]urrently, Dutch science shops are still engaged in processes of change, but unfortunately, it seems to me, the available options and decisions are insufficiently debated and theorized" (p.268).

[33] The study's final report is named "Democratic Governance through Interaction between NGOs, Universities and Science Shops: Experiences, Expectations, Recommendations".

shop practice seen through the lenses of the different actors involved - the university, the science shop and the community groups - "similar[ly] to the model of the Triple Helix of university-industry-government relations" (Jørgensen et al., 2004). However, although the study tried to conceptualize the role of universities by making reference to contemporary theoretical approaches (such as the model of the triple helix; Leydesdorff and Etzkowitz, 2000), it had difficulties to produce a theoretically consistent and empirically sound account. This may be due to the rather ambitious design of the study: it was composed by a number of national case studies carried out by a large number of different researchers. The final report reveals a rather heterogeneous set of discourses and perspectives and is in fact a good example of the diversity of perspectives present in the science shop movement.

2.2. Critiques of the role of science shops in the democratization of science and technology

The claim of contributing to democracy by supporting community groups in their particular concerns has also received critiques. One such critique is that science shops would promote applied research in response to interest groups. These interest groups are certainly different from the usual counterparts of applied research, but they are still "clients" (and even denominated this way by many science shops). What is then the difference to conventional applied research that gives science shop work its noble quality of contributing to democratization? And should one not be rather skeptical of such a project that potentially endangers the independence of research if taken to its extreme?

This is a well known question for science shops. Following the INTERACTS final report, there are evidently common features of science shop work and conventional knowledge transfer activities as well as problem-based pedagogical approaches:

> "Science Shops have many parallels to knowledge transfer in the business field, with the capacity to apply theoretical knowledge and problem-solving learning methodology to real-life situations through experiential learning, and equipping students with the essential skills for future work. In this way Science Shops contribute to a learning approach, which is becoming increasingly important in the education of professionals." (Jørgensen et al., 2004:101/102)

As we have seen earlier, the difference lies with the kind of groups served by science shops. Science shops aim at working with "*civil society*, providing knowledge to *citizen groups* that could not themselves pay for or invest in research" (idem, own italics). Discussing the sense of

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participatory design (which is close to or sometimes part of science shop work), Sclove (1995:195) suggests that the argument that academic freedom is potentially endangered does not take into account the fact that research and development already are "socially guided and constrained", so that there is no such freedom. As a consequence, science shop CBR cannot be accused to endanger something that does not exist. Such argumentation as provided by Sclove and science shop practitioners does not prove totally satisfying in explaining the particularity of science shop work and the sense it makes. I will discuss this question in large detail in chapter five.

Other voices are skeptical about the possibilities of adaptation of the concept with regard to the university reforms taking place worldwide and to the change in the relations between science and society. This question has been posed by Wachelder (2003) who held that we have to revise the theoretical foundations of science shop work but that we should not judge the project itself as being impossible. It has also been argued that the progressive professionalization of NGOs[34] could make science shops lose their 'clientele' (Leydesdorff and Ward, 2005). This has been contested by others that have emphasized the still important role of science shops in spite of this professionalization (Brodersen, Jørgensen and Hansen, 2006).

Still others posed the question whether the gap between research and community groups can be bridged at all (Irwin, 1995; Douglas, 2005). These authors point to inherent tensions of the science shop concept, "a deeper incongruity (or structural incompatibility) between the needs of citizens and the cognitive and institutional structure of contemporary science" (Irwin, 1995:161). Numerous accounts of science shop work document this difficulty, for instance when questions posed by community groups are not deemed to be attractive for university researchers or students (Farkas, 2002:91) or when the urgency of such questions can only rarely be responded to (Brodersen and Jørgensen, 2003:110/113). Richard Worthington (2007:477) also expresses skepticism concerning the possibilities of achieving the goal of influencing science and technology development by promoting CBR.

Such skeptical reflection is paralleled by positive accounts of moments when "the magic of science shop work" comes to play (Stewart quoted in Irwin, 1995:166), for instance when science shops do manage to establish ongoing research on the basis of CBR projects (Hende and Jørgensen, 2001; Jørgensen, 2005; Zaal and Leydesdorff, 1987).

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[34] As for instance analyzed by Jamison (2001) for Sweden, Denmark and the USA.

Both analysts of science shops and practitioners emphasize the need for the combination of practice and theoretical analysis, in order to make the "step from 'talking the talk' to 'walking the walk'" (Mulder et al., 2006) a well done one. They suggest that "one could further explore the tasks of science shops in combining normative concerns with analytical perspectives, and the inherent tensions of this type of work could also be made visible" (Leydesdorff and Ward, 2005:369, drawing on the Interacts final report). This goes hand in hand with a demand to make the research results generated by science shops more easily accessible, as reports often end up closed away in shelves as "grey literature" (Fischer et al., 2004).

The research that I present in this thesis aims to contribute to empirically grounded theoretical reflections on science shop work, and hopes, in doing so, to render explicit certain choices of science shops with respect to their perspective on democracy.

2.3. Science shops versus other forms of participation in science and technology

The birth of the science shop concept in the 1970s was part of a general emergence of participatory approaches in science and technology from the late 1960s onwards[35]. The "thriving methodological innovation" happening in this respect during the last decades (Chopyak and Levesque, 2002) has led to a large variety of forms of participation in science and technology (and of references to their democratizing nature). Given this large variety, I will now further examine how science shops oriented towards innovation and technology may be located on the landscape of current reflections on participation in science and technology.

In order to do so, it is necessary to clarify of what science shop concept I want to speak, considering the diversity of approaches that science shops represent today. The science shop concept may be understood in fact as a frame that allows to develop all sorts of other participatory procedures[36]. On the other hand, the emphasis made by the 'official' science shop discourse on the demand-driven approach contained in the science shop concept suggests (as described earlier) that we can speak of a participatory procedure in its own right

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[35] An overview of the development of the field of participation in science and technology from the 1960s on (which does not make explicit reference to science shops) has been provided for instance by Lengwiler (2008) who follows the historical evolution of the participatory phenomenon from the end of the 19th century until today. Less recent overviews of the field that should be mentioned (and that equally do not mention science shops) are those offered by Rowe and Frewer (2005; 2000), the special issue of Science and Public Policy (vol.26, nº5, 1999) coordinated by Simon Joss, and the overview given by Fiorino (1990).

[36] This perspective is supported for instance by the circulation of the "Participatory methods toolkit" (Elliott, Heesterbeek, Lukensmeyer, and Slocum, 2005) in the Living Knowledge network.

based on a specific participatory principle. The discussion in this section follows this second option.

To begin with, the different forms of participation in science and technology may be classified as either **giving way to 'claimed spaces of participation' or offering 'invited' spaces of participation** (Gaventa, 2006). Under the category of 'claimed spaces of participation', or 'bottom-up' approaches to participation (Bucchi and Neresini, 2007), we could list those forms that emerge without the solicitation of institutions. Some forms of this bottom-up participation address specifically aspects of *technological innovation*[37]: Hess (2005) describes "technology- and product-oriented movements" concerned with topics such as nutritional therapeutics, wind energy, and open-source software; Rohracher and Ornetzeder describe similar phenomena for instance for the field of sustainable energies under the notion "user-driven innovation" (Rohracher, 2005; Ornetzeder and Rohracher, 2006). The democratic relevance of such movements has been mentioned by von Hippel for the open software movement (von Hippel, 2005), and has been analyzed by Feenberg (1999; 2002) from a philosophy of technology perspective. Inherent dilemmas of this kind of participatory forms are related to processes of stabilization and institutionalization: these carry with them the establishment of hierarchies and the integration to the market and to institutional policy making that challenge the very bottom-up character of such movements (Hess, 2005).

In contrast, spaces of 'invited participation' are those produced through devices promoted by the institutions of science and technology or by governmental bodies – with a variety of motivations, be they a desire to remedy a lack of bottom-up participation or its insufficient integration into decision making or be they their legitimating or demobilizing potential for otherwise too contested decisions (Rowe and Frewer, 2000). Also these forms of participation proliferate. They take the form of *deliberative* mechanisms concerning, for instance, the development of nano- or biotechnologies (such as consensus conferences, see Joss and Durant, 1995) or of different formats for *consultation* (as for instance certain forms of participatory technology assessment). They may also aim at producing a *constructive participation in innovation*: here again a wide variety of approaches can be found, including 'participatory design', different forms of constructively oriented 'technology assessment' (Bröchler and Simonis, 1998; Petermann, 2000; Rip, Misa and Schot, 1995), 'backcasting' (Quist

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[37] In the field of participation in science, notions employed to describe different manifestations of this kind of participation have been "popular epidemiology" (Brown, 1987, 1997), "civic epistemologies" (Jasanoff, 2005), or "citizen science" (Irwin, 1995; see also Leach et al., 2005).

and Vergragt, 2006), and 'foresight' (Böhle and Rader, 2003). The inherent dilemma of invited forms of participation, called by Irwin (1995) the "participatory dilemma", is that the very fact of inviting for participation easily reproduces or reinforces those asymmetries the participatory procedure was designed to challenge.

A first point of interest when trying to situate science shops in the general panorama of participation is the question where they can be located in relation to the categories of claimed and invited spaces of participation. At first glance, the science shop concept may be understood as an invited space created for the support of bottom-up participation (claimed participation): as an institutionalized mechanism, it tries to connect the academic institutions to the dynamics of social mobilization. Science shops have been interpreted in this way by Bucchi and Neresini (2007) as a 'bottom-up' version of community-based research. A decisive feature of the science shop concept thus seems to be its interest in providing a link between academic institutions and spaces of claimed participation. It is important to note that this interpretation corresponds to the *current situation* of science shops: the historical account of the science shop movement's development outlined earlier in this chapter shows that in their beginnings science shops could probably be situated on the extreme of claimed participation. It is their progressive institutionalization at universities that created the necessary interest in the relationship between claimed and invited participation.

Focusing then on invited or institutionalized forms of participation, a second point of interest is the **scope of research interactions** that these participatory procedures may envisage in order to contribute to technological change. Invited forms of participation in technology show different focuses in this sense, so that some may center rather on a very local level of interaction while others may address rather global players in technology policy. In order to situate the technology-oriented science shop in this respect, I will discuss this continuum between the local and the global, from the object-orientation to the R&D policy making in the light of two well-known participatory approaches: the participatory design approach and constructive technology assessment.

Participatory design (Kuhn and Muller, 1993; Muller, 2002) consists of a range of methods and practices concerned with producing interactions between designers and the users of a particular technology or product. Participatory design builds on an important trajectory of practical application worldwide[38]. While the fields of application are various, computer

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[38] This is for instance visible in already two decades of the biannual Participatory Design Conference that gathers practices from all over the globe (see for instance www.pdc2008.org).

systems design (Kensing and Blomberg, 1998; Schuler and Namioka, 1993) play the most prominent role.

The underlying motivation for producing such interactions between designers and users may be merely instrumental, as it is likely to increase the usefulness of the product. Participatory design may also go beyond the instrumental motivation and be driven by an interest in addressing the *politics of design*, that is, in bringing, through the interactions between designers and users, the critical relevance of design choices to the foreground. This second interest is in line with the approach's origins which were explicitly political, as part of the Scandinavian workplace democracy movement (Muller, 2002). When showing such a political interest, the question arises for participatory design practitioners how far the scale of the problem addressed should be enlarged to encompass wider aspects, that is to say, how far it is necessary to include into the politics of a specific design task a broader consideration of aspects and actors – how far 'the local' may be related to 'the global' as Bjerkes and Bratteteig (1995) put it. For example, if considering participatory workplace design, the question arises how far and in which way aspects concerning the organizational set-up within the company or concerning the company's environment should be addressed.

Participatory design proposes thus a participatory shaping of R&D activities by focusing on designers or developers and users as principal actors. In contrast, constructive technology assessment (Schot, 1992; Schot and Rip, 1997; Rip, Misa and Schot, 1995) is part of a "tendency in recent SST[39] work (…) to take a broader terrain from the start - a sector, system, arena or other part of the sociotechnical landscape – and a multi-actor and often multi-level scope" (Russell and Williams, 2002:77). Recognizing the *distributed character* of innovation, constructive technology assessment sets out to propose participatory strategies for the control and the steering of technological innovation on a wider scale.

Constructive technology assessment may be understood as integrating the idea of interaction as present also in participatory design and similar perspectives into the policy-focused concept of *technology assessment*. Based on the insight that traditional technology assessment fails to address the complex and distributed character of innovation as it is primarily focused on policy assessment, constructive technology assessment proposes integrating assessment through interaction between experts and citizens into the whole process of innovation, that is from the

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[39] SST is the abbreviation for *Social Shaping of Technology*, the term the cited authors employ for capturing the range of STS perspectives showing a (social) constructivist perspective on innovation and technological development.

early phases such as design and development until the moments of diffusion and implementation (Petermann, 2000; Rip, Misa and Schot, 1995). With this, the approach seeks to disprove the so-called 'Collingridge dilemma', which holds that intents of controlling technology development in its environmental and social effects entail an inherent impasse produced by two opposed problems: an information problem, as impacts cannot easily be predicted until the technology is extensively developed and widely used; and a power problem, as control or change is difficult when the technology has become entrenched (Collingridge, 1980). Constructive technology assessment holds that introducing participation during the entire innovation process would resolve this alleged opposition of knowledge and control. Three criteria – anticipation, reflexivity and social learning – are supposed to guide interaction in this sense: anticipation as a remedy for the lack of knowledge about future impacts, reflexivity as a mechanism for adjusting decisions, and social learning for giving strength and substance to the outcome.

Since its beginnings, constructive technology assessment has been a rather programmatic approach. Experimentation on how to put its rather demanding program into practice has been visible from the 1990s onwards in the Netherlands (Rip, 2007). On the one hand, those experiences took the form of "social debate as a way of integrating science, technology and society in a constructive manner" as promoted by the Rathenau Institute; on the other hand, Arie Rip's team at the Twente University developed constructive technology assessment further as a scenario approach, an approach which it is currently applying to nanotechnology (ibidem). Apart from these Dutch experiences, the concept has moreover inspired policy makers on a wider scale. Genus (2006) notes that over the past fifteen years or so explicit or implicit reference to constructive technology assessment has been made in the practices and policy documents of public decision-making bodies in (especially) the Netherlands and Denmark, as well as at the OECD and in the EU[40]. Constructive technology assessment has moreover stimulated others for proposing similar approaches as for instance the 'real-time technology assessment' approach as proposed by Guston and Sarewitz (2002).

As indicated earlier, the two approaches can be contrasted to the science shop concept by asking how each approach links the 'politics of design' (the small but critical decisions in design and development) to the 'policy making' happening in the institutions – those of

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[40] It seems to be difficult to discern how far this dynamic may be understood as a spreading of CTA, as Genus and Coles (2005) suggest. The examples given by Genus and Coles (p.435) seem to be rather examples of public participation initiatives *inspired by* CTA principles or following similar ones instead of a direct application of the CTA approach.

representative democracy and other institutions concerned with decision making on science and technology. We could say that participatory design, when driven by a political interest, focuses on the first and is confronted with the question how to widen that focus in order to address aspects going beyond the local. In contrast, constructive technology assessment seeks to link both in an organized chain of decisions[41]. Also the science shop concept comprises both dimensions, as science shops seek to contribute through a co-production of knowledge to socio-technical change (to a 'democratization of science and technology' or to a 'more democratic governance', as we have seen earlier in this chapter). The official science shop discourse shows then an interesting separation: on the one hand, it wants to establish a chain from the politics of the particular CBR processes facilitated by a science shop to the university teaching and research agenda. On the other hand, the CBR processes acquire a political meaning beyond the university, as the CBR processes are also meant to support the community groups' particular political concerns (to 'empower' them); this second link to the institutions is however not part of the participatory procedure itself. The involvement of the CBR process in the politics of the community group may happen occasionally (when for instance the researchers or students involved come to defend the research before tribunals) but is not integrated into the design of the model, where researchers and students are rather protected from the policy arena.

The science shop concept is thus concerned with the question in what way one participatory device may be able to connect different political spaces. Unlike participatory design, it wants to work simultaneously on the level of the politics of design and that of wider policy making taking place in different arenas. Unlike constructive technology assessment, it does not construct a coherent chain or network of connections between the different spaces of politics to be addressed; it separates the political spaces lying within the university from those 'outside' which it considers the realm of politics of the community groups, considering however the connection between the two spaces as being important.

To conclude, the technology-oriented science shop shows two particular characteristics that distinguish it from other forms of participation in technology: first, the interest for offering an invited space for claimed participation, and second, the consideration that the participatory procedure addresses separated spaces of politics which are not controlled by the science shop.

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[41] In this respect, recent discussions of '*interactive technology assessment*' have questioned the possibility of creating through such participatory technology assessment exercises "the ideal conditions for real public debate", arguing that these should be viewed "as an additional public arena in which sociotechnical controversies are played out" (Marres, Joly and Rip, 2008).

At first glance, this characterization seems to respond to the strong democracy perspective on science shop work, a perspective critically discussed earlier in this chapter: it resonates especially with the view that science shops are 'intermediaries' that care for an integration of the underrepresented at the same time as they maintain distance to the politics of the community groups. However, the following chapters of this thesis will show that the two characteristics do not necessarily contain this particular democracy perspective; I will suggest that they may be also interpreted in terms of a positioned and involved mediation.

3. THE SCIENCE SHOP OF THE TECHNICAL UNIVERSITY OF DENMARK

The remainder of this chapter will give an overview of the DTU Science Shop[42]. This institution pertains with its almost 25 years of existence to the "second wave" of science shops. This means that it is one of the oldest non-Dutch science shops, yet it was inspired by the Dutch model. It shares with Dutch science shops the fact that it is university-based and also university-funded. More so, it disposes of a similarly positive political and social climate that makes Denmark an especially fruitful terrain for science shops due to the "country-specific patterns of political culture and civil society" (Fischer et al., 2004; see figure 1.3). However, Danish science shops do not dispose of the wide recognition within society that Dutch science shops enjoy. Science shops are rather poorly known, so that community groups often are not aware of the possibility of handing in requests (Brodersen and Jørgensen, 2003:112).

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[42] The Science Shop of the Technical University of Denmark has been closed in the beginnings of 2010, handing over part of its functions to the knowledge transfer office of its university, DTU Match. This recent change could not anymore be considered in this research. However, this news is in line with the less recent developments of this science shop, that I will describe a bit further on, and, as a consequence, its integration into the analysis would not change importantly the research result.

In *Denmark*, Science Shops are not only continually active, but also report an ongoing and strong cooperation with NGOs and civil associations. This *constantly high* pattern of activities can be explained by a lively and active civil society in combination with a political culture that widely recognizes the need for public participation in science and technology.

Denmark has a more than 150 years' tradition of "associationalism". Beginning with the constitution of 1849, the Danish state has always regarded a lively civil society, and, more precisely, a rich associational life, as a means of integrating society, enhancing patriotism and performing functions of the welfare state. Cooperatives of peasants and workers have helped to improve the social situation of these groups and to transform Denmark into a modern economy. Today, associations run free schools, provide adult education, and offer a multitude of services in the areas of education, sports, leisure, and culture. The state supports these activities by funding the associations as long as their structure and purpose follows basic democratic principles. As a consequence, we find that associational membership is as high as 3.4 memberships per adult and both membership and activity have even risen since 1979. This translates also in political participation and interest.

A second important source for Science Shop support is Denmark's strong participatory tradition in the areas of technology assessment and environmental decision making. For example, the "consensus conferences" about new technologies and their social implications have been developed in Denmark. The Danish Board of Technology, an advisory body to the Danish parliament, considers the involvement of the public in debates about technology using consensus conferences and scenario workshops as one of its tasks.

In the 1970s and 1980s, Denmark like other West European countries was shaken by protest movements tabling the issues of peace, women's liberation and youth self-determination (e.g. the squatter movements). One core area of contentious politics was nuclear energy. Movement activity helped to achieve the abandonment of government's plans for nuclear power plants in 1985. In the course of these conflicts, the anti-nuclear movement OOA (Organization for Information on Nuclear Power) managed to politicize the public and raise demand for participation and information in technological decision-making.

Academics were active in these movements, bridging the gap between university and the public. They answered the demands for information with a concept of democratization of academia and access to scientific knowledge for the public.

Figure 1.3. A perspective on the political and cultural circumstances for science shop work in Denmark. Source: Fischer et al., 2004:203,204, references removed.

The DTU Science Shop is a very active member of the international Living Knowledge network, having been involved in all the European projects described above and having been responsible for several of the corresponding reports. It also forms part of a regional network of Zealand science shops[43] that, apart from the DTU Science Shop, includes those of the University of Copenhagen and the University of Roskilde. The network collaborates both in the mediation of CBR processes (for instance by reconducting requests according to the different resources at the different universities), through information exchange and in public relations

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[43] Zealand is the island of Denmark located in its East and includes the capital region of Copenhagen.

work (including the publication of the magazine *Anvendt Viden*), and by providing a forum for the network's members for discussing their work.

Its staff is today composed of Michael S. Jørgensen, the coordinator who is employed by the DTU as associate professor; Søsser Brodersen, a research assistant and PhD student; and one student assistant. Both the coordinator and the research assistant perform teaching assignments and research apart from their tasks as science shop staff.

As for the number of projects and requests dealt with per year, in 2009 the Science Shop received 26 new requests, had 68 open demands (based on these new requests and on older ones) and 12 projects have been carried out. Most of these projects (10) were carried out by students as part of their Bachelor or Master thesis, as usual; two projects were carried out by the Science Shop's coordinator himself. In the case of student projects, these are not paid, so that the research can be offered for free to the demanding community groups. They are in general coordinated by the Science Shop.

Having provided a general overview of the DTU Science Shop, I will now describe its development over the past decades and characterize the way it currently works. Thereafter I will describe the development of the urban ecology group that has evolved in close contact with the Science Shop. Finally, I will give an overview of the Science Shop's day-to-day work.

3.1. The DTU Science Shop's trajectory

3.1.1. The beginnings: the Interdisciplinary Center

The DTU Science Shop started as an "Interdisciplinary Center" (IC) and developed only later into the form it has today, as a response to organizational changes at the DTU. In the following lines I will briefly describe this development.

Created in 1985, the Interdisciplinary Center was inspired by the then still young Dutch science shop model. Visits to Dutch science shops led the founders to consider the need for providing the IC with its own research and teaching capacity in order to be able to influence and "renew" the university's R&D agenda and educational curriculum (Jørgensen, 2005). This goal was pursued since the very beginning by the still not formalized IC and was inscribed into its organizational design when it was finally established in 1989 as a common unit among five departments of the DTU[44]. As a totally university-funded science shop, the IC had as its staff

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[44] The five founding departments of the interdisciplinary center were: The Department of Social Sciences (where M. S. Jorgensen did his PhD), the Department of Work Environment, the Department of Road Planning, Traffic Planning, and Urban Planning, the Department of Systems Engineering ("Anlaegsteknik"), and the Physics laboratory nº 3. See

members two permanently employed associate professors, one full-time secretary, and disposed of student assistant hours equivalent to one full-time employee. The tasks of the associate professors were subdivided into one third each for the daily work in the Science Shop, for research and for teaching. The renewal of university research and teaching had thus been embedded in the very organizational design of the IC as part of its mission and as part of the job definition of its two employees. The range of activities to be carried out by the IC included accordingly community-based research, research and teaching in user participation and holistic technology development, as well as the collaboration with other institutes in research and teaching in areas that could benefit from the demands coming in from community groups.

The IC determined a number of priority fields for its "renewal activities" (Hende and Jørgensen, 2001), namely urban ecology, cleaner technology, organic food production and user-directed development of technologies for disabled people. Following the Science Shop's accounts (ibidem, pp.31-33), we see how the IC managed to introduce teaching and research activities in these fields by "networking" with other departments:

- In 1987, the IC started a collaboration with the department for urban planning. Both developed jointly a course on urban ecology, based on an on-going research project at the IC. This supported the establishment of an urban ecology teaching and research unit with a strong orientation towards participatory research and with a close connection to the IC. This unit exists still and is described later on in this chapter[45].

- The IC started "courses within cleaner technology, environmental management and life-cycle assessment together with departments for working environment, ecology and environmental sciences, chemical engineering and manufacturing engineering at the Technical University. Based on inspiration from requests to the Science Shop and on experiences from earlier research, the Interdisciplinary Centre took as much as possible a citizens' and employees' perspective in their contributions to the courses" (Hende and Jørgensen, 2001:32). Also this initiative could be stabilized in the form of permanent courses on the 'management of environment and working environment' and on the 'life cycle assessments of products and systems'. The Science Shop's coordinator participates as teacher in these courses.

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interview [I3].

[45] A more detailed description of the establishment of this group is given in the last section of this chapter.

- Around 1989 the IC sought to initiate a collaboration with a DTU department for food technology on a project with community organizations involved in activities related to organic agriculture and to the food sector. Although researchers from the department had been collaborating with the IC as supervisors for CBR projects, it was not possible at that moment to enroll them into the project, so that the IC decided to apply for funding on its own. The Science Shop played here the role of an "incubator" (Hende and Jorgensen, 2001:31) for a new research area. This led to the progressive establishment of a research group in the field of organic food production, which still exists today[46].

An important milestone in these networking activities was a three years research program on urban ecology and cleaner technology from 1991 to 1994:

"The Interdisciplinary Centre was encouraged to organize and co-ordinate this programme, because university politicians found that the community relations and the research capacity of the centre were two important prerequisites to the research programme within urban ecology and cleaner technology at the university. Altogether, 16 departments and research units took part in the programme, which was applied for as a so-called high-priority area at the university. The group got money from the University for a visiting professorship, three Ph.D. grants, two senior researcher grants and seed money for [the] preparation of research projects." (Jørgensen and Hende, 2002:43)

The IC was thus able to establish itself as a recognized player within the DTU and achieved important support from the university. This enabled the centre to fully deploy its networking activities with departments and researchers in order to establish and develop research activities within its priority areas[47].

The IC disposed of an advisory board[48]. This board was composed of representatives of several NGOs (not necessarily 'users' of the Science Shop), such as one defending the interests of

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[46] The process of establishing this research group is documented in more detail in Jorgensen and Hende (2002), Hende and Jorgensen (2001), and Brodersen and Jorgensen (2003).

[47] Be it as the main responsible of such research activities or as a support to other researchers for developing them, as for instance in the establishment of "green water management" as a new research area. Here it was a researcher from the Department of Environment and Resources that was the driving force in developing a new research field at his department, supported by the Science Shop (Hende and Jørgensen, 2001).

[48] The advisory board substituted the earlier "board", which had been part of the initial design of the Interdisciplinary Center. The change was made a few years after the beginnings of the Center due to organizational modifications at the DTU. The earlier board had been composed of representatives of the internal representative bodies of the DTU and members of the five founding institutes. With the conversion to an *advisory* board, its

disabled persons, one or two environmental NGOs, as well as the Danish Board of Technology and one trade union; of students; and of teacher representatives from the then Educational Committee of DTU, which was responsible for deciding about the educational program of the DTU. As the Science Shop's coordinator remembers, the advisory board's role was to provide a space for strategic discussions on the Science Shop's work. Looking back, he remembers that it did not prove as useful as expected but that nevertheless "good inputs" came from DTU internal members concerning the strategies for integrating the science shop work into the DTU students' education. As a further positive factor he considers that the advisory board improved the Science Shop's legitimacy by working on "a DTU civil society", that is, by creating dialogue and networking and, in doing so, enrolling others in the project [I3][49].

3.1.2. The conversion to a department-based science shop

In 1995, following a new legal framework for universities in Denmark, the DTU was restructured. This led to the integration of the IC into the newly created *Department of Technology and Social Sciences*. The IC had been "part of the planning group and became part of the department together with units for social sciences, working life, technology assessment and didactics" (Jørgensen, 2005). With this move, the IC as such ceased to exist and was transformed into the Science Shop as part of one particular department at the DTU.

This meant that the Science Shop lost its strategic position that it had at the DTU through its affiliation to five different departments. Also the advisory board, that was meant to provide a structural anchorage to entities outside the group and the department, ceased its activities about ten years after the IC's beginnings. It had relied on the voluntary work of its members, which showed to be difficult to be maintained for such a long time [I3].

Significantly, from this moment during on a number of years the renewal activities went down. During the existence of the IC its staff had assumed a central role in many of the research projects that the IC carried out together with other DTU departments[50]. With the change in the Science Shop's position at DTU and the reduction of its staff, the capacities for doing so

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composition was modified to a mixed one of DTU internal and external members.

[49] See appendix A, interview nº3. Throughout the thesis, references to the interviews are indicated in this format.

[50] When the IC was responsible for the before described three years research program, Michael S. Jørgensen was for instance *project manager* of two research projects, one related to organic food processing and distribution and the other to "employee training for environmental review coordinator", financed by the Ministry for Agriculture, Food and Fisheries and the Ministry for Education respectively; he was *coordinator* of research activities within cleaner technology at the DTU, and participated in two international projects financed by the European Commission.

became more limited. They went slightly up again only recently with activities in the field of user-driven innovation and dialogue about nanotechnologies. Equally, in a current project on climate change the Science Shop coordinator is assuming a very active role as the subject is close to his specialization in environmental issues.

In 2001, in a second restructuring of departments the *Department of Manufacturing Engineering and Management* was created that among other departments included the former Department of Technology and Social Sciences. The role of the Science Shop continued to be recognized still as an important one within the new department. Brodersen and Jørgensen (2003:116/117) described the attitude of the department's head as positive towards the science shop, acknowledging its role in creating interactions with groups that the university usually does not cooperate with; groups that he considered equally important partners for the university as the private business in order to overcome the ivory tower position of the university. However, in spite of this positive attitude of the department's head, by the time of this second institutional change the staff of the science shop had already been reduced to just one instead of the two original positions, as a consequence of the death of one of the two researchers whose position was not newly assigned. In 2003, Søsser Brodersen joined in as a research assistant. Her position is however partly externally funded.

Finally, in 2007, a third restructuring of the DTU's departments led to the creation of the *Department of Management Engineering* through a merger of the Department of Manufacturing Engineering and Management with other departments. In this move the above-mentioned urban ecology group, pertaining until that moment to the Department of Civil Engineering, was integrated. The Science Shop's coordinator perceived the creation of this new department as a prioritization of research areas rather distant from those of the Science Shop.

1985: Creation of the Interdisciplinary Center.

From 1987 on: Creation of the urban ecology group and the organic food group.

1989: The IC is permanently established as a so-called 'common unit' among five departments of the DTU.

1991-94: Research program on urban ecology and cleaner technology.

1995: The IC becomes a science shop affiliated to the Department of Technology and Social Sciences.

2001: Formation of the Department of Manufacturing Engineering and Management that includes the former Department of Technology and Social Sciences and with this the Science Shop, as well as the organic food group.

2007: Creation of the Department of Management Engineering through the merger of the Department of Manufacturing Engineering and Management with other departments. The new department includes not only the Science Shop but also the urban ecology group.

Figure 1.4. Overview of the history of the DTU Science Shop. Source: own elaboration.

Figure 1.4 gives an overview of the trajectory of the DTU Science Shop. We see that in fact the institutionalization of the Science Shop went hand in hand with the establishment of two research groups that responded to the initial goals of the IC in urban ecology and organic food respectively – it may be coincidence or destiny that brought the different groups finally together within one single department. However, while the initial department was in its orientation close to the fundaments of the Interdisciplinary Center (which had participated in its planning), this new department responds to an agenda influenced by other priorities to which the different groups probably will have to adapt somehow in order to fit in. This change is symptomatic of a progressive loss of institutional support for the Science Shop who had to spent considerable effort on justifying its existence over the last years, as I will describe a bit further on.

3.1.3. The Science Shop's position at the DTU today

The account of the Science Shop's trajectory shows how it evolved from a unit formally linked to a number of different departments to becoming part of one particular department. Despite this evolution it has not turned into a specialized Science Shop, as department-based ('centralized') science shops are generally described (Gnaiger and Martin, 2001; Farkas,

2002:88) but aims at serving the DTU as a whole[51] – its characteristics correspond thus neither totally to those of a centralized nor to those of a decentralized science shop as characterized in science shop literature. This means that it covers a wide range of areas in which it does not necessarily dispose itself of the relevant disciplinary knowledge, which makes its networking capacities with a large variety of research groups decisive for guaranteeing the technical quality of its collaborative research projects. It does however dispose of its own research capacity, a feature that centralized science shops do not necessarily show (Farkas, 2002:160).

An important aspect of being a department-based science shop is the fact that it relies exclusively on the department's support - with the corresponding positive and negative consequences. As Farkas explains,

"Academic departments may protect decentralized science shops from university cutbacks. In addition to overhead support, departments are a buffer between the science shop and the university administration. This can be dangerous, however, because department cutbacks could have the potential to wipe out the science shop." (Farkas, 2002:164/165)

Although being a hybrid, it was the second kind of menaces that the DTU Science Shop had to cope with in the past. The negotiation about the Science Shop's role in the department is documented for instance in a number of "strategic papers" responding to the different "development contracts" outlining the development strategy of the DTU[52]. In these texts, the coordinator sought to argue how the Science Shop fits into the strategy and the goals outlined for the University's development. He argues that the Science Shop in fact covers especially well certain aspects, such as those related to the "collaboration with society", sustainability issues, or the focus on the students' competences which are enhanced by practical learning experiences. The coordinator highlighted thus the "points of contact" that exist at least between the DTU's strategic discourse and the Science Shop's work. The need for justifying the time spent on the Science Shop by the coordinator and the other staff members and arguing for continued support of the Science Shop has been significant in the last time and pressure has been increasing, similarly to what many other science shops experience as we have seen above.

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[51] However, according to Fischer and Wallentin (2002:14) "the Science Shop's affiliation to a department has to some extent isolated it in the daily work. Some students seem to consider the DTU Science Shop as the Science Shop of the department and not the Science Shop of the whole university. Therefore, students from other departments may abstain from contacting the Science Shop (experience of Michael Søgaard Jørgensen, interview with Hanne Nyeng, member of the staff at the Science Shop at Technical University of Denmark 2002)".

[52] Jorgensen (2006) for the period 2003-2008, and Jorgensen (2001) for the previous development contract.

In this sense, the fact that the Science Shop is not only an intermediary but disposes of an own research and teaching capacity provides two benefits: not only does it thereby have an influence on the university's key missions, namely research and education; it also makes the staff's positions less vulnerable through integrating them more strongly into the university. Its coordinator, a chemical engineer with a PhD in technology assessment from the DTU's Institute of Social Sciences, has teaching and research functions at the DTU at the same time as his teaching tasks are reduced to allow him to fulfill his role as coordinator. This permits him to concentrate part of his research activities on Science Shop issues, including the projects developed by the international network described in section 1.2, to which the DTU Science Shop has contributed significantly. Also the PhD student working at the Science Shop as a research assistant is doing research on a topic related to science shops. Her PhD project "Strategies for analysis, abatement and prevention of air pollution developed through interaction between research institutions and civil society organisations" is part of a research co-operation involving the DTU Science Shop, the Risoe National Laboratory and the EU Network of Excellence in Atmospheric Composition (ACCENT). She has moreover participated in the INTERACTS and ISSNET projects. Both the coordinator and the research assistant fulfill teaching assignments. In his role as an associate professor, the coordinator lectures on a variety of topics related to environmental and societal issues (see figure 1.5). These courses aim at providing students with a holistic understanding of their future roles as engineers and planners and at enabling them to become 'change agents'. In addition to this, the PhD candidate working at the Science Shop participates in the teaching of a course named "Theory of science in engineering" that aims at introducing DTU students to the field of science and technology studies.

Teaching assignments of the Science Shop's coordinator:

- Responsible professor of the courses: *Management of Environment and Work Environment in a Network Perspective (42542)*; *Introduction to Industrial Environmental Management (42470)*; *Technology and International Development Co-operation (42644)*; and the 'open' course *Preparation of Field Study Within Environment and Development* (42645), which is tailor-made to the preparation of DTU students for a field study about sustainable development.

- Participation in the courses: *Life Cycle Assessment of Products and Systems (42372)* - both 20% of 10 ECTS; *Environment and Sustainability (12202)* - 15% of 5 ECTS; *Sustainable Production (42342)* - 1 day only; and in a postgraduate program in environmental management.

Figure 1.5. The courses given by the DTU Science Shop's coordinator at DTU. Source: [I3], DTU course catalogue.

Last but not least, we have seen before that an organizational feature of possible strategic relevance for the Science Shop is the advisory board. In order to strengthen the Science Shop's position at the DTU, the revival of such an advisory board has been tried once and been discussed several times. It is considered a means for engaging DTU researchers in their research interests and in their quality of supervisors, as the Danish case study report for the INTERACTS study explains:

"The Manager of the Science Shop at DTU and one of the Eco-researchers [a member of the organic food group] pointed out, that there is a need of strengthening the shop's relation both internally at the institute, but also to the other institutes which use the Science Shop, in order to make the researchers scientifically interested in the requests of the clients and in order to engage the researchers to become more active in the process of selling the request of the clients to students. The relationship could be strengthened by re-establishing a counseling committee with internal and external members, which have existed in the Science Shop at DTU in the past, because this would give opportunities to discuss future expectations, strategies and wishes representatives for students, researchers and civil society organizations" (Broderson and Jørgensen, 2003:113)

However, such recreation of the board failed, and no new attempts have been made afterwards, primarily due to the lack of time and resources that would be necessary for such an undertaking [I3].

3.1.4. The DTU Science Shop's perspective on its work today

The DTU Science Shop is one of those science shops explicitly concerned about its contribution to democracy. This can be seen in a number of publications about this topic issued by its staff, be it in the title (Jørgensen, 2005; Brodersen et al., 2006) or in discussions of the "benefits" of science shop work in a more general paper (Jørgensen, 2005). The Science Shop coordinator is moreover co-author of the final report on the Interacts study whose title also explicitly refers to the "democratic governance through interaction between NGOs, universities and science shops" (Jørgensen et al., 2004).

Its discourse resembles that of the general science shop discourse on democracy as discussed in section three of this chapter. The Science Shop sees as one of its goals and benefits the "empowerment" of community groups and the "more democratic access to the resources of the university" (Jørgensen, 2005:8). The DTU Science Shop's emphasis on the participatory character of its projects, both at the moment of their definition and during their execution, shows that the community groups are equivalent partners in the knowledge creation process, which is considered a further feature of democratic value. This is in accordance with Irwin's argument that a sign of quality of science shop work is how far the issues are framed *between* the implied parties (Irwin, 1995:161), and also with Farkas' (2002) "partnership model of democratic expertise".

The activities directed towards a renewal of teaching and research are a special concern of the DTU Science Shop and not commonly present at science shops[53]. The Science Shop does not relate them explicitly to its goal of democratization. It does so however indirectly: as they are considered as relying on particular CBR experiences, they bring the concerns of the community groups into the university's research and teaching agenda. The *relationship* between the CBR processes and the corresponding renewal activities in terms of democracy is however not explored in detail in the corresponding texts, although they make clear that the Science Shop plays a strong role of mediation.

In general, the pronouncements of the Science Shop about its own work show a strong emphasis on positive accounts of its performance. Such *strategic* behavior can be seen as a response to the different threats that university reforms and the changing political climate engender. This is visible in its before discussed statements on the DTU strategy, where the Science Shop sought to position its work and to show how it matches the goals and the mission

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[53] The aim of the "renewal" of teaching and research is for instance not shared with the other Danish science shops (Brodersen and Jorgensen, 2003:9).

of the university. When dealing with these issues, the Science Shop faces very similar difficulties to those described by Wachelder (2003:255) for Dutch Science Shops. The increasingly managerial character of DTU and the growing reliance on external funding makes the Science Shop more and more vulnerable. A "much stricter academic regime" (ibidem) both for students and researchers reduces the potential interest and availability for science shop projects. And last but not least, the professionalization of community groups increasingly questions the sense of science shop work – an argument that the Science Shop's staff counters with determination, as I have mentioned in section three.

The Science Shop's coordinator also aims at making connections with academic debates that are related to the Science Shop's work, as for instance the "mode 2" discussions that the coordinator transformed into a "community-based mode 2" (Jørgensen, 2004). In doing so, he seeks to make science shop work visible and to point to its meaning for these academic debates.

Let me now turn to the establishment of the urban ecology group – a development considered to be an important part of the history of the Science Shop by the coordinator. I will describe how the group evolved in close contact with the IC at the same time as following its own path. The presentation of this group is moreover relevant as the CBR project analyzed in chapter three was not only about urban planning but was also supervised by one member of the group.

3.2. The parallel evolution of the DTU urban ecology research and teaching unit

The very beginnings of the urban ecology group are located before the creation of the Interdisciplinary Center. A timeline drawn during an interview with M.E. and S.B.N. [I17], two members of the group, situates the first steps of the group in the 1970s. M.E. was then still a Master student and started to orient himself towards urban planning and in particular towards two principal areas of interest: living conditions and citizen participation. Together with J.K., a teacher of him at the Department of Civil Engineering at DTU, he started to develop research in these areas. The beginnings consisted in a rather theoretical elaboration in M.E.'s PhD research on the spaces and conditions for integral solutions of urban ecology with citizen participation. After finishing his PhD and working for a short period of time in a private company, in 1988 M.E. was asked by J.K. to participate in a project where he could apply his theoretical ideas about participation (this time on an urban renewal project with the Danish Crime Prevention Council). The innovative project sought the participation of the future inhabitants both in the creation of their future living spaces and in the management of the

process. This project, experienced as successful by M.E., was an important learning experience on the meaning of participation in urban planning, and was followed by numerous other projects with a participatory approach - as a highlight he was in 1991 involved in the development of the internationally known European Awareness Scenario Workshop methodology in the frame of his work at the Danish Board of Technology.

By that time, the development of the urban ecology group and that of the Interdisciplinary Center were closely associated. This link was also an institutional one, as the department of the urban ecology group (the Department of Civil Engineering) was one of the five departments that the IC was affiliated to. The course on urban ecology mentioned before became part of a wider collaboration and common networking activities, including the collaboration and shared responsibilities in the renewal program aiming at establishing urban ecology and cleaner technologies as "interdisciplinary priority areas" at the DTU. This led to establishing a link to the Environment and Resources Department of the DTU. This way, the urban ecology group and the interdisciplinary center were part of a renewal movement at the DTU that managed to promote a considerable engagement of DTU research in ecological and social concerns and participatory practices, as described earlier.

More or less at the time that the Interdisciplinary Center became a department-based Science Shop specializing on the role of intermediation, the urban ecology group grew into a research and teaching unit of its own right. This happened by integrating two PhD students, S.B.N. and B.H., who represent today together with M.E. the core of the group. Their PhD projects enriched the group's research activities in its focus, introducing early STS approaches, and through international networking[54].

The group's trajectory from then on shows that while it strengthened its focus on citizen participation and sustainability, the orientation of its research and teaching activities also had to follow the changing priorities of its department[55]. The group had to adapt to the changing

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[54] In this sense, S.B.N. worked on the transformation of technical infrastructures, investigating how to link sustainable projects with wider networks of infrastructures. As her project was linked to a European FP4 project, it helped establishing international networking with a focus on questions about sustainability in urban infrastructure management. B.H. as the other PhD student in the group introduced the social construction of technology approach into the group. This was partly due to her connection to the Department of Manufacturing Engineering and Management, which not only hosted the science shop but was also home to STS research at DTU.

[55] Concerning the research interest in participation and sustainability, particular highlights were the publication of a handbook about public participation (Hoffman and Kofoed, 1999); the participation in the European project "New Intermediary Services and the Transformation of Urban Water Supply and Wastewater Disposal Systems" under the Fifth Framework Programme; and a project in collaboration with the DTU's Environment and Resources Department about waste water handling in sewerless areas, which put in practice a new approach for embedding new

strategy of its department, which abandoned urban ecology as a field of interest. It adapted by orienting its research towards infrastructures and "facility management": it converted into an "urban technology and management" research and teaching unit and participated in the creation of the Centre for Facilities Management (launched in 2008) – this, however, does not mean that it has abandoned its former priorities altogether, as its activities still focus on sustainability and participation.

One of the group's members characterizes her professional approach to participation today as one of being a "facilitator" of dialogue, with entails being a "critical friend" of the citizen groups[56]. An example of a project evaluation carried out by this member, B.H., may clarify her understanding of these notions. The project was about urban ecology and had been carried out by two NGOs and a local governmental entity. B.H. describes her role in the evaluation as a mediator between different perspectives. Rather than taking sides for one of the parties involved, she would try to take into account the perspectives of all the actors and facilitate between them. In doing so, she maintains that she would follow what she calls an issue-oriented ("faglig") perspective: her intervention would be guided by her concern for sustainable development at large and would avoid a strong attachment to individual interests. Having said that, she acknowledges that she would sometimes explicitly take a stand for the NGOs' perspective, this in contrast to other researchers who are usually more inclined towards the local government's perspective. Her approach exemplifies a general ambiguity of the researcher's position in participatory research between an interest for the issue and an attachment to the citizen groups, an ambiguity that will be explored in this thesis.

The group's interest in participation and sustainability is also visible in its teaching activities, where it offers a number of courses concerned with these questions[57]. The courses show a focus on citizen participation, as for instance through the collaboration with a co-housing association as part of the course design. They deal furthermore with urban planning in an integrated view, through linking social, political and technical processes. They focus on local processes or situations, in one course explicitly on conflictive ones. They promote a variety of communication and research competences that are usually underrepresented in engineering

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technologies through a participatory process.

[56] At the same time all of them are also personally engaged in different Danish NGOs concerned with ecology and participation.

[57] The courses referred to here are (as appearing in the DTU course catalogue, accessed in November 2008): Basic Course in Urban Planning (2270), Local Sustainable Urban Development (42276), Plan & Development (42829).

education (writing skills, realization of interviews / qualitative research) but relevant for the future professional activity of the students, be it in research or in applied contexts[58].

We can understand the urban ecology group's development as in fact a parallel trajectory to that of the IC. The two groups had to cope with similar pressures when adapting to the changing circumstances at DTU. While both shared an interest in participation, ecology, and integral or holistic solutions, one group took the path of specializing in a particular discipline whereas the other rather specialized in the role of an intermediary, addressing the whole range of disciplines present at the DTU[59].

In the next chapter, we will have a closer look at the implications of the Science Shop's decision to embark on this second path. Before concluding this chapter, it is useful to provide a brief overview of the Science Shop's day-to-day work.

3.3. *The day-to-day work of the Science Shop*

The issues dealt with in the staff meetings taking place every two weeks illustrate well the daily Science Shop work. During the period I attended the meetings, usually the following points were discussed: new requests; the status of on-going projects; follow-up activities and the maintenance of relationships after the finalization of a collaboration; aspects related to the Science Shop's national and international networking activities; aspects related to the Science Shop's strategy and functioning; and aspects related to the promotion of the Science Shop's visibility.

The Science Shop dedicates considerable effort to make itself visible, especially in response to the fact that science shops are hardly known in Denmark and even at the DTU. These efforts include publishing articles in the DTU newspaper and in local newspapers and the edition of the national network's journal Anwendt Viden (2 issues / year), that contains principally summaries of the realized research projects by the different science shops who form part of the network. Another task is to make visible and attractive the demands that the Science Shop receives from the community groups to the students and researchers. This is done through the

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[58] Several members of the urban planning unit are also involved in the pedagogical improvement of teaching at DTU. The university counts with a "learning lab", an "internal consultancy unit" that guarantees the pedagogical training of DTU teachers. One member of the urban planning unit is part of the staff of the institution.

[59] As described earlier, the Science Shop's staff has participated importantly in European research projects on science shop work, that is, on doing research on its very role of an 'intermediary' or 'mediator' (see chapter two and five for a discussion of these terms). Its coordinator has continued doing research in sustainability issues. The link of these research activities to the Science Shop's work is now much weaker than it was during the times of the Interdisciplinary Center.

distribution of the Science Shop's "catalogue" (which contains those demands) within the DTU, presenting the Science Shop and current demands at the beginning of a number of selected courses. Its webpage with an associated database offers an updated version of the catalogue.

Whereas the student assistant assumes administrative tasks that include the reception of incoming requests, the facilitation of projects lies either with the coordinator or the research assistant. In the following lines I will give a brief outline of this facilitation task and I will come back to this issue in chapter three where I will discuss a particular project from its beginning to its end.
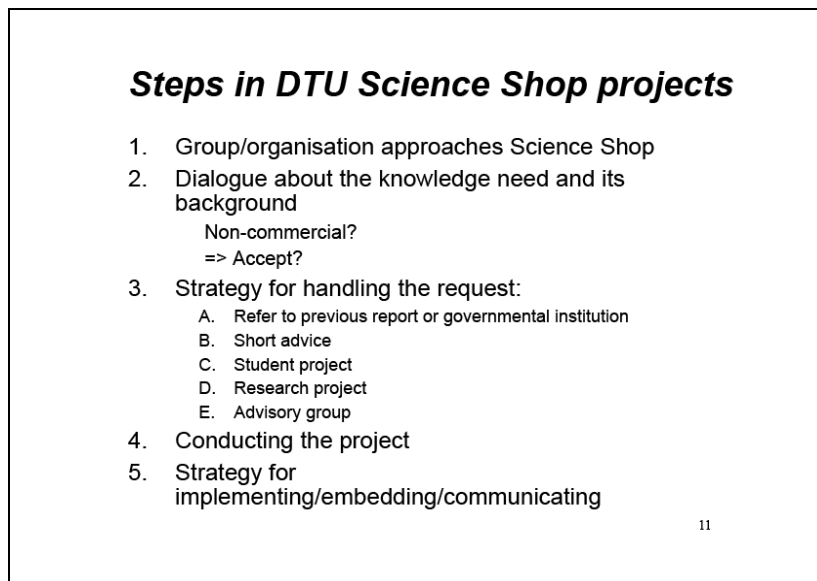
Figure 1.6. Steps in DTU Science Shop projects. Source: Jørgensen 2008 (PowerPoint presentation made at the Universidad Politécnica de Valencia)

Figure 1.6 shows the steps of a typical project as summarized by the coordinator. Starting with a request coming from a community group, a "dialogue" follows in order to determine the "knowledge need" contained in the request and whether it responds to the criteria of acceptability (this aspect is discussed in more detail in the next chapter). Depending on the results of this initial evaluation, the Science Shop may consider that the knowledge need can be satisfied by already existing research results to which the community group is referred to or that it should be redirected to another institution. Otherwise, it may conclude that a project with students or researchers would be adequate, or the Science Shop may propose other possibilities such as the creation of an advisory group instead of a research project. Often requests are also considered to *possibly* meet the criteria (which means that the request would need to be slightly changed). In these cases, in collaboration with the community group the request is adapted so that it would meet the different criteria without betraying the

community group's interest. For instance, when the request comes from an entity whose characteristics do not clearly meet the access criteria (for instance, being part of a public administration, which is usually considered to dispose of the resources necessary to access research via other means), the Science Shop usually tries to propose ways of connecting the request to an entity that would be eligible. I will discuss the handling of such requests in more detail in the next chapter.

Once a request has been accepted, it is transformed into a demand that is published in the catalogue. Although not contained in figure 1.6, this step proves crucial in the process. Indeed, much science shop literature documents this step and I will explore this issue by an in-depth study of one particular project in chapter three. Suffice it to say here that the community group's request needs to be transformed into a *research question* that is attractive to students or researchers, which is mostly not the case with the initial request.

If a demand catches the attention of students or researchers or when the Science Shop's active search for students or researchers proves successful, the next step is the setting up of a research team. It is then that the project can be started. The Science Shop assumes generally the coordination and facilitation of the process. This means that it assures that at least three meetings take place where all the involved parties assist, that is, the students, the members of the community group, the supervisor and the Science Shop's coordinator or research assistant. These three meetings consist of:

- An *introductory meeting*, where the demand is discussed and the project is defined and planned by the participants, taking especially into account the time frame and the knowledge and capacities required for the project.

- A *midterm meeting*, where the status of the project is discussed and the original design and focus of the project reviewed.

- A *final meeting*, where the results are presented and discussed, as well as their possible use by the community group and the way to make them public.

Ideally, the Science Shop revisits the process one year later in order to obtain insight in the actual use of results. However, in the last years the Science Shop was not able to develop such an evaluation activity in much depth.

As for the quality of the research, scientific supervision is assured by the supervisor in the case of student projects, whereas the Science Shop looks after the way in which the collaboration is

managed. The Science Shop staff considers its role here important as often the different parties involved are not aware of the potential for participation of their project [I4]. The Science Shop follows furthermore the way the initial criteria are taken into account during the process. I will give an example for this in chapter three, describing one intervention of the Science Shop that aimed at producing a non-commercially oriented and publicly available research outcome.

CONCLUSIONS

This first chapter has provided an overview of the development of the science shop movement and the perspectives on democracy in play since its beginnings. The movement's trajectory shows how the spreading of the idea has been accompanied by adaptations and closures, menacing the very core of the movement. The growth has led to a large diversity of science shops today, a diversity which makes it difficult to speak of the concept of science shops in a singular and unambiguous way. This diversity affects naturally also the democracy perspectives present in the movement. I have reviewed the relevant discussions of these perspectives and I have sought to characterize what may count as the movement's 'official' discourse. The situation of science shops with respect to other forms of participation in science and technology, in terms of the position it seeks to occupy between invited and claimed spaces of participation and in terms of the type of interactions sought through participation.

The chapter has also served for providing the reader with an introduction to the DTU Science Shop – a very active member of the international network and one of those science shops explicitly concerned with its contribution to the democratic governance of science and technology. We have seen its evolution from an Interdisciplinary Center, with broad ambitions and important support from and within its university, to a department-based Science Shop with progressively less structural foothold. Amongst other aspects, this change has affected its capacities for pursuing its explicit goal of taking influence on university research. I have furthermore outlined the democracy perspective of the Science Shop as present in its discourse, which appears to be very much in line with the dominant interpretation of science shop work in terms of 'strong democracy'. This review provides a basis for the following chapters, where I will concentrate on the Science Shop's *practice*. We will see that this practice indicates an alternative democracy perspective.

The description of the trajectory of the urban ecology research group, which has developed in parallel and in contact with the Science Shop has shown some aspects of the wider

circumstances at the DTU. The group's history and perspective is important to keep in mind for chapter three, where I will analyze a particular CBR process facilitated by the Science Shop and supervised by a member of the urban ecology group.

CHAPTER TWO. THE DEMOCRATIC SIGNIFICANCE OF THE DTU SCIENCE SHOP'S SELECTION OF REQUESTS

INTRODUCTION

In this chapter, I will make the ground for an alternative interpretation of science shop work in terms of the democratization of science and technology to the dominating one. We have seen in chapter one that the usual reference in this sense is that of strong democracy as adapted by Richard Sclove (1995) to science shops. However, as I will argue here, this perspective does not give a satisfying explanation of the science shop work that I have analyzed in my field work. The analysis of the DTU Science Shop's work in terms of the selection of requests offered in this chapter not only shows that a change of perspective is needed but already offers a direction of interpretation. By drawing from recent theoretical developments in STS literature about democracy that shift the focus from taking the human being as point of departure for understanding democracy questions to locating the *issue* in the center of debate (Marres, 2005, 2007), a coherent interpretation comes into sight.

The chapter starts with an introduction into the work of qualification of incoming requests and groups as practiced by the DTU Science Shop. This qualification relies on a number of criteria that the Science Shop uses in order to delimitate the kind of demands and groups to be finally accepted. We will get to know these criteria and see that they apparently transport a democracy perspective close to that of strong democracy. A closer look on the application of the criteria will allow to explore their democracy meaning in practice. For this aim, I will present first the range of 'clients' and the kind of demands that the Science Shop has admitted in the past. I will then look closer at the criteria in action. I will discuss here first the day-to-day qualification work of the Science Shop and afterwards take a closer look on two particular collaborations in order to characterize the community groups and their requests. The analysis shows that the strong democracy perspective comes short; it however permits a conceptualization of the Science Shop's approach in the frame of the above mentioned issue-centered perspective on democracy. This conceptualization will be given in the second part of

the chapter, where I will propose an interpretation of the observed qualification work of the DTU Science Shop in terms of 'issue articulation'.

By focusing on the qualification of incoming demands, the chapter offers an analysis of the first step in this issue articulation. It gives a starting point and a frame for the following chapter where I will look at the entire chain of such an articulation process from the definition of the demand to the proper collaborative research process initiated on its basis.

1. DISCREPANCIES BETWEEN THE 'STRONG DEMOCRACY' PERSPECTIVE AND THE DTU SCIENCE SHOP'S PRACTICE

1.1.   The selection of requests is a complex task

An extract of an interview with the DTU Science Shop's coordinator may give a first orientation over the difficult landscape of decisions involved in the process of the selection of the requests and community groups to accept for collaboration. In order to introduce the extract, I will briefly present the entities and aspects that the coordinator refers to. In the moment of the interview presented here, the coordinator tried to explain to me how the Science Shop qualified the community groups that participated in two CBR projects about carsharing with regard to the criteria. One of these groups, Københavns Delebiler (in the following Copenhagen Carshare), is an association that promotes carsharing in Copenhagen. It has started only a few years ago but has grown very rapidly and is still doing so. The other group is the Danish carsharing umbrella organization Danske Delebiler that comprises the whole of the Danish carsharing organizations; these are in their majority also associations with the exception of Hertz Delebilen, the only *company* in Denmark offering carsharing by that date. A recent initiative by Copenhagen Carshare and Aarhus Carshare was to create a *fund* to which externalize their more business-like activities: This would allow them to keep their associative character at the same time as to professionalize their management in order to respond to the growth. The coordinator refers moreover to two projects carried out in collaboration with public administration bodies: one with the Lyngby-Taarbæk municipality on climate change measures, accepted once also a NGO was part of the project's committee; and another one with the Vognporten day-care center, a public kindergarten near Copenhagen city, that dealt with the use of organic food in the center's kitchen.

With this brief introduction, the reader may follow the coordinator's intent of explaining the Science Shop's way of deciding over the acceptance of a request:

"I think 15 years ago we had this big discussion with for example the Aalborg Science Shop: whether it was a good project, was that enough. So you had a company doing environmental management, wouldn't we then take it in? And we said no, we would not do that. (…) [O]f course it's interesting to look into this [fund created by] Copenhagen Carsharing, but still I would see that the Copenhagen Carsharing as such is a non profit [organization]. While I see Hertz as something different. I mean, they rent out cars, and then they have taken on board this carsharing. So I would say that still the criteria about [a] 'non commercial' [aim], [be] part of some kind of a change, and then something about the [lack of] economic ability, would still fairly fit into it. But you're right at the same time (…), we would also look into it. Every time. (…) [I]f you take for example the Lyngby-Taarbæk [collaboration]. We didn't take in the Lyngby-Taarbæk [project] without having them coming together with the NGO. Which probably almost all the other science shops would have done. There we are still, we want this to be anchored more with the civil society. (…) Maybe in some cases you could say, if you wanted a change, then maybe you could [accept also commercially oriented requests. But] if you really want a carsharing and hoping that people would really skip their car, I am not sure if Hertz would be the one that really would do that. (…) [O]f course you could say, if it's a question about making changes: how do you really make change? Is that sometimes just by one big actor that could [makes "chopping" sound] just... It could be possibly have been the [Lyngby-Taarbæk] municipality that would say, okay, now we just do that. But there I would say, okay, we still think it's the civil society (…) that we cooperate with. So it's the citizens in Lyngby-Taarbæk, and now this NGO, it's the staff and the parents in Vognporten... In some cases we may have to think more about how do we make the implementation strategies. There was a project, last year (…) about the access of disabled people in a wheel chair to a camping car. Where there was developed this (…) concept (…). [T]here was a discussion at the exam, and there was an agreement between the student, the supervisor and the client about, let's not make it public yet, let's try and see what would be the best strategy to get this concept further developed. Would that be to try to make an agreement with one company? 'Okay, you will now get this.' Then I don't know how you will commit them to really try to develop it. Or would you really think, 'Oh no, it's best that we simply publish it, and in principle send it to all of them, and then hope that maybe there could start some competition'. (…) [I]f we think about something that has service or product character, maybe there could be that idea. I don't know if some of those things that come out of the Lyngby-Taarbæk project (…) could be taken somewhere else also. I don't know." [I2]

This interview extract shows that the selection of the community groups and requests through the application of the criteria is a rather complex task. A number of aspects can be retained in this respect – I will give a brief outline in order to get back to them during the chapter:

- First, the extract shows that the coordinator recognizes the situated judgment involved in the application of the criteria, as the cases may show ambiguities in this sense. The criteria help here but show to be something that may be changed over the time: the coordinator emphasizes that the Science Shop "still" sticks more or less to the same criteria as in its beginnings but he makes them appear not so much a dogma but rather a tool that is still proving useful. The account shows that, most of all, the criteria require "looking into" the community group in order to make a fine judgment.

- Second, the extract shows how the Science Shop coordinator considers the criteria a means of getting *access to 'civil society' groups* and to *dynamics of socio-technical change*. The attachment to civil society groups is the principle that the Science Shop goes for in order to contribute to change, as the commercial interests of companies may easily be opposed to the goal of such change.

- Third, the extract shows that at the same time as the Science Shop shows a philosophy of a bottom-up socio-technical change that it would like to support, it recognizes the challenge of relating such bottom-up initiatives with the world of companies, commerce and profit orientation and the uncertainties associated to it. The example given by the coordinator for an especially strong dilemma in this sense relates to a project concerned with *technological innovation*, where commercial aspects play more evidently a role than in other areas.

So, the extract served to open the chapter presenting the interpretative work involved, the motivation underlying the criteria, and the relevance of the dynamics of socio-technical change as well as the uncertainty about them that make such interpretative work a complex undertaking. The next step is then to look how these different aspects are present in the application of the criteria by the Science Shop in its daily work.

1.2. An apparent strong democracy perspective

From the interview extract, we have understood that the task of the criteria is to enable the Science Shop to select those groups and requests that would represent 'civil society' concerns underrepresented in university research and teaching. Let's have a closer look on them in

order to understand how they are thought to fulfill this aim. In the interview, the coordinator referred briefly to the three criteria: a "non commercial" aim, be "part of some kind of a change", and having an insufficient "economic ability". These criteria are in fact rather a kind of know-how than a set of fixed principles as the coordinator makes understand when he says for instance that they "would still fairly fit into it". Very much in line with the criteria generally used by science shops (as presented in the foregoing chapter), a more elaborated version may go as follows[60]:

1. The research serves a *non-commercial interest*; results should be, in general, made public. While proposals normally should come from *civil society organizations*, they may come also from private persons if their focus is on a broader social or environmental interest.

2. The demanding group should not have the resources to access research via conventional ways.

3. The demanding group should be able to use the results (a support by the Science Shop staff in this sense is given).

A brief analysis of these criteria helps to develop an idea of the kind of democracy perspective they transport:

The non-commercial aim: To accept only non-commercial requests is intuitively related to an increased probability of supporting 'true' civil society concerns, as no private profit objectives are in play. Although of course also commercial interests may serve social or environmental goals, the Science Shop considers that they dispose of other means of getting research done. Moreover, by taking in commercial interests, these could easily come to dominate the activity of the Science Shop, to the disadvantage of non-commercial ones. At the same time, the interview extract shows that the coordinator is aware of the difficulty of drawing a clear line between a commercial and a non-commercial interest.

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[60] I depict the criteria as the Science Shop's coordinator explained them to me. The only place where the Science Shop's criteria are explicitly mentioned (but giving in fact less requirements) is its website that explains to possibly interested community groups that "the only conditions are that the problem is based on your group's / association's activities and does not have a commercial purpose. In return, we provide help for free." (www.vb.dtu.dk/index.php?id=1; accessed October 2009).

The lack of resources: The criterion addresses the question of equity in the access to DTU research – the Science Shop not only wants to attend exclusively non-commercial interest but within the groups that may pose such requests those that are factually excluded.

Be part of some kind of change: This criterion transports an interest in contributing to real change. The community counterpart should be able to *use the results*[61], so that the invested efforts make a difference in real life and not only on paper. This emphasis on the use of the results is bound to the idea that legitimacy is given through efficiency. This legitimacy counts for justifying the Science Shop's existence (the Science Shop tries to promote projects that have ongoing impact in order to have impact on its own) but also for compensating the efforts invested by the students, the supervisor, and the community group. The Science Shop work wants to produce tangible outcomes, it seeks a results-oriented applied research.

These criteria seem to be in line with the democracy perspective on science shop work as outlined in the foregoing chapter both for the official science shop discourse and for the DTU Science Shop: the criteria provide a means for selecting those interests underrepresented in university research, by including community groups in representation of 'civil society concerns'. The criteria are thus an instrument for the *legitimate* selection and for achieving a certain *representativeness* of the groups, and they should guarantee their empowerment.

Now, the interview extract has already given an idea that the application of these criteria is not an easy task. In practice, they seem to be more a kind of guideline in the evaluation of requests[62] but not at all a mere recipe. They rather describe certain lines where the decision over the acceptance of a request moves on, so that the evaluation finally relies on an important portion of common sense on the side of the Science Shop's staff. In the end, the range of requests that is given access is wide, and if an incoming request cannot be admitted as such, the Science Shop always tries to shape it in a way that would make it suitable for developing a collaboration - its translation function is here very important. Furthermore, if a request does not fulfill the criteria, the Science Shop also often re-conducts the request to other researchers or organizations that could give a positive response. So as Farkas (2002) observed for the Dutch science shops (as cited in chapter one), also at the DTU Science Shop

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[61] Results can be "material" outcomes such as the reports, a physical intervention, etc., but the Science Shop values also as such non material outcomes such as learning processes, as was the case in the Vanløse process described in the next chapter.

[62] I will use the notion 'request' for the initial question posed to the Science Shop by a community group. I will use the notion 'demand' in order to speak about the requests once transformed into an official demand for collaboration. When this distinction is difficult to apply, I will stick to the generally used notion of 'demand'.

the criteria are thus interpreted with a certain flexibility: We may ask then what this flexible interpretation does to the democratic claim that is transported by the criteria. In order to discuss this question, I will look in the next sections closer at the application of the criteria.

1.3. The selection criteria in action

In order to see how the DTU Science Shop applies those criteria and what kind of demands are accepted, I will give on the following pages an overview over the range of community groups and topics covered by the Science Shop; I will analyze examples of the daily qualification work observed at the Science Shop; and I will discuss afterwards the criteria in relation to two particular CBR processes facilitated by the Science Shop.

1.3.1. The range of accepted groups and issues

In September 2007[63], the database of the Science Shop included 405 organizations or private persons that some day had posted a demand in its catalogue. The range of 'clients' goes from private persons to large Danish or even international NGOs, with a wide variety of also middle sized organizations or groups (we find one family, and often rather informal groups of citizens, and different types of associations; in figure 2.1, the first twenty groups listed in the database are shown in order to give an idea of the variety).

The Science Shop doesn't require any degree of institutionalization of a possible demander, but rather checks if requests of private persons can be related to some broader concern and also how the requesting person or group envisages putting the result into practice, as we have discussed above. In contrast, the very large NGOs which show an advanced degree of professionalization are on the limit of admissibility – in spite of their non profit orientation, the considerable amount of resources that some of them dispose of enables them actually to fund their own research, as well as their organizational structure and functioning may resemble rather a company than an association (as it is the case of Greenpeace, one big organization that appears in the database; Jamison, 1996).

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[63] The number has certainly increased since then, however, the data from 2007 gives a sufficient insight in the kind of organizations and persons that the Science Shop collaborates with.

1. A Danish non profit artist group that develops projects related to "economic forces, democratic production conditions and self-organization" and publishes the developed tools on the internet for free use.

2. A municipality and the local branch of a Danish ecologist association – a "consortium" with whom the Science Shop works on climate relevant improvements in the municipality

3. An independent information center for environment and health issues with public funding.

4. One private person with a demand concerning disability issues

5. One private person with a demand concerning sustainable building in development countries

6. An association promoting a tunnel to the island Bornholm

7. A citizens' initiative against a sawmill

8. The Danish umbrella organization of carsharing initiatives

9. An association of dental technicians

10. A Copenhagen carsharing association

11. A confederation of homeowners' associations in Copenhagen

12. A working group for manufacturing engineering in a trade-union

13. A local Agenda 21 group

14. A foundation that seeks to promote a dialogue between the Danish and the Finnish population

15. A housing cooperative in a municipality close to DTU

16. A kindergarten

17. An Agenda 21 Center

18. A non profit fund running the public bikes in Copenhagen

19. A housing co-operative

20. A senior housing co-operative

Figure 2.1. An extract of the DTU Science Shop's database. Source: DTU Science Shop

The *range of topics* treated in the Science Shop can be appreciated by taking a look on the array of demands published in one particular year. Figure 2.2 presents the index of the DTU Science Shop's catalogue of the course 2002-03 – a year where also the Vanløse demand discussed in the next chapter figured in the catalogue[64]. So in the year 2002, the catalogue included a total of 50 different project propositions[65], coming from about 30 different organizations. The demands addressed the needs of professionals (for instance, physiotherapists and theater workers) concerning the improvement of their work environment

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[64] By selecting this particular catalogue, this overview can be understood at the same time as a contextualization of the Vanløse demand with regard to the variety of demands awaiting projects at that moment at the DTU Science Shop.

[65] The catalogue lists the demands according to thematic areas. As some demands may concern several areas simultaneously, they show repeated entries in the catalogue.

in health or environmental aspects, and a large set of environmental and social concerns brought forward by different kinds of 'community groups'. They asked both for analysis (for instance, an analysis of the water consumption in a day care center, of the usage of genetically modified food, or different demands regarding traffic) and for development (for instance, an equipment for torture victims or several demands for developing applications or equipment for handicapped people); some were very specific for one particular local concern (as the demand coming from the Green Guide of Birkerød), while others sought to address a wider frame (straw as construction material).

Work environment and environment

Evaporation of chemical substances from hot water basins

Noise hypersensitivity and tinnitus

Design of music rooms in a new culture house

Inclusion of requirements for theater worker environment in the design of theaters

Handling of private bulk waste

Decalcification of water in housing associations

Analysis of water consumption in a care center

Project possibilities at the Green Guides (Grønne Guide) in Birkerød: Environmental and energy check of shops

Sustainable environmental and energy projects in Copenhagen

Ecological space – a new concept for the concretization of sustainable development

Lake restoration

Building and city planning

Design of music rooms in a new culture house

Town Planning in Vanløse

Straw as construction material

Rain water collection in Kæphøj

Aggregation of dwellings with addition of bath rooms

Maintenance plan for Smedegårdsparkens Communal Areas

Design and construction

Development of equipment for torture victims

Equipment for handicapped people for camping cars

Construction and control of an easel

Morse code devices for handicapped people

User controlled 'Multi-Purpose Bus'"

Electronics and IT

Electronic speech recognition

Development of a PC program for teaching children with speech disorders

Energy

User controlled 'Multi-Purpose Bus'

Farm installation for the production of rapeseed oil

Farm biogas in Denmark

International energy projects

Study of energy and environmental advantages with a motor preheater

Reduction of heat and electricity consumption for the Trørød dormitory

Consumer, biotechnology and food ware

Food quality and supply: what means ecology, biotechnology, contamination

An analysis of how gene technology is introduced at Danish schools and universities

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Noise and acoustics
Noise hypersensitivity and tinnitus
Design of music rooms in a new culture house
Noise in Humlebæk
Traffic and transport
Measures for traffic limitation in Studiestræde, Copenhagen
Traffic surveys in Humlebæk
Treatment of cyclists in the reorganization of traffic
A study of transport habits of young people
Gravel roads for cyclists
Commerce, drivers and cyclists
Cost-benefit analysis of bicycle investments
Cycling over bridges
Study of cyclist and driver behavior in relation to traffic rule of "looking back"
Fuel saving cars – myth or reality?
Children transport
Tensions between EU and modern transport politics
European transport lobbyism
Bus service versus train service in minor routes
Danish carsharing habits
Fehmarn Belt bridge
Is Copenhagen's "Finger Plan" still appropriate?
Transport culture
User controlled 'Multi-Purpose Bus'

Figure 2.2. The demands listed in the catalogue of the DTU Science Shop in 2002-03. Source: DTU Science Shop[66]

The review of the demanding entities and the topics touched by their demands points to a correction in perspective concerning the Science Shop's goal of creating an 'access for civil society organizations'. This goal may incite the observer to understand the work of the Science Shop as directed to the support of *specific societal groups*, as if it would want to put university to the service of those groups. However, the application of the criteria shows a certain indefiniteness concerning the kind of groups that would be supported. An indefiniteness that may move on a line between the non-commercial and the commercial interest (the first

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[66] Whereas most of the demands are more or less self-explaining, some require some further explication:

- About the Fehmarn Belt bridge: This project aims at connecting the German island of Fehmarn with the Danish island of Lolland with a bridge crossing the 18-kilometer wide Fehmarn Belt in the Baltic Sea. It is expected to be completed 2018. It is controversial with regard to possible damages to local wildlife.

- About the 'Finger Plan': "The Finger Plan is Denmark's town planning showcase", informs the Ministry of Foreign Affairs of Denmark on the official website of Denmark. The name refers to the imitation of a hand with its fingers in the development of the city of Copenhagen and its surroundings (Greater Copenhagen): "The infrastructure of roads and commuter railways forms the backbone of the Finger Plan, but it covers the overall metropolitan development, i.e. where people will work, live and have their service requirements met. The Finger Plan is historic – presented in 1947 – but its key principles still apply to Denmark's metropolis, Greater Copenhagen" (Matthiessen, 2008).

criterion); or on a line between having or not having the necessary resources (the second criterion). This becomes visible in the presence in the database of groups of *professionals* at the side of 'purer' community groups (the interest brought forward by professionals to improve working conditions is considered as non-commercial although serving also their employing company) or of the Danish carsharing umbrella organization who defends not only the interests of a large number of carsharing associations but also that of one *company* (as I will discuss in more detail in section 1.3.3.2). It becomes also visible in the presence of groups belonging to public administration. The criterion of resources usually excludes public administration, as this should have the resources for getting access to university via the conventional ways. But it seems that 'poor parts' of it may be treated as if they would not have these resources – as is the case of the kindergarten (a public institution) listed in the database and mentioned also in the initial interview extract. And, last but not least, it becomes visible in the presence of large, professionalized NGOs whose organizational nature may resemble more a company than a grassroots group.

1.3.2. The re-configuration of requests into demands

It may be then interesting to take a closer look at the qualification work behind those decisions of which the database and the catalogue give account. On the following pages, I will discuss thus the daily work of the DTU Science Shop when dealing with the task of deciding over the acceptance of a demand and its inclusion in the catalogue. I will describe for this purpose some moments during the periodically held coordination meetings of the staff of the Science Shop that I attended during my visit.

1.3.2.1. Who brings the research questions to the Science Shop? Beyond the demand-driven approach

In general, the Science Shop waits for community groups or individuals to come with an issue that goes then through a process of qualification: it follows a "demand-driven approach". At times, it follows however also a proactive approach, and in fact the lines in between them are not so clear.

So when following a demand-driven approach, the demand by the community group can be rather concrete. For instance, the staff discussed during my visit a possible collaboration with Superflex about the development of a simple technology for producing biogas in developing countries. A demand can be also very open, as was the case with that posed by the

Copenhagen Environment and Energy Office (KMEK)[67]. KMEK impulses all sorts of ecological projects and understands itself as a kind of incubator of these projects that later acquire a life on their own [I8, I12] – as happened for instance with Copenhagen Carsharing, which is one of the projects 'born' by KMEK. In this line, the organization was interested in receiving students that would bring forward own ideas to be realized in the realm of the organization. It thus had decided to post a very general demand in the catalogue in order to attract students to be creative for them.

But the Science Shop is not strict with the demand-driven approach, performing sometimes also a proactive role in the definition of possible projects. This is the case with its current activities about climate change which were initiated by the coordinator in view of the UN conference on climate change in Copenhagen in the end of 2009 (and that the interview extract exposed at the very beginning of this chapter referred to). They had their beginnings during my visiting time at the Science Shop, when the Science Shop's interest in climate change work found an anchor point in a demand coming from the local public administration of Lyngby, the home town of the DTU. Before my arrival, the local administration of Lyngby had approached the Science Shop because of their interest of reducing the CO2 emissions in the town. They asked the Science Shop for advice what DTU could offer them in this respect. As mentioned earlier, the Science Shop does not attend demands from public administration, as this is supposed to have resources for finding alternative ways of having their needs addressed. However, the Science Shop considered the issue brought forward interesting to engage with. In order to make the collaboration with public administration suit the Science Shop criteria, the Danish Society for Nature Conservation (Danmarks Naturfredningsforening) was proposed to become a partner in the project in a triangle-collaboration with the Science Shop and the administration. Having the ecologist group accepted, the Science Shop turned into the dynamizing element of the triangle. It organized a meeting between the different actors in order to allow a discussion of what aspects or activities should be taken into account when developing measures for CO2 reduction in Lyngby and it developed a range of networking activities in relation to this demand. So, in this case the Science Shop showed to

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[67] KMEK is a Copenhagen-based association which provides free, impartial information and guidance on energy conservation, renewable energy, waste minimization, and related issues. The carsharing initiative is one of the many projects initiated by KMEK during its 20 years of existence, being their biggest and maybe also most famous project the offshore wind farm on Middelgrunden, just outside the harbor of Copenhagen, which was installed on the basis of citizens' initiative and resulted in the world's largest cooperatively owned wind energy development, according to the promoters (www.middelgrunden.dk).

actually *promote action concerning climate change*, taking the local administration's request as an opportunity for doing so.

We can retain several points from these examples: first, the Science Shop's practice does not always follow a demand-driven approach, although the bigger part of its work responds to that principle. Second, even when the Science Shop follows the demand-driven approach, this does not necessarily locate the problem definition with the community group. We have seen an example where this was due to the explicit wish of the community group for receiving the DTU students' creativity in the frame of a very general demand; but it is in fact a general feature of the Science Shop's work that the problem definition that gives the basis for a CBR process is a *shared process* between the community group, the Science Shop and the students and researchers involved in the process[68].

1.3.2.2. Making the demands meet the criteria

The Science Shop's involvement in the shaping of the demands responds on the one hand to the need for making the community group's request compatible with the needs and interests of DTU students and researchers. On the other hand, I could observe that the Science Shop intervenes also in order *make the requests meet the criteria* when they initially would not clearly do so but show some potential in this sense.

In one of the Science Shop coordination meetings I could attend to, a recently received request from a dentist was discussed. The dentist was interested in a project that would develop a particular kind of bandage that would improve the treatment for her patients. During the discussion, the Science Shop staff tried to understand what would be the interest of that dentist: would such a project serve merely her own professional performance or could there be some wider use of such a project? The staff wondered whether the demand could be related to the interests of some patient organizations that could be concerned with such an improvement, or to one of elderly people who would especially benefit from the envisaged new type of bandage. The request finally did not manage to figure in the catalogue, although the Science Shop might have helped in finding possible addressees at the DTU for the project.

The year before my visit, the Science Shop had taken in a similar but different demand. That time it was an association of dental technicians asking for a project on the reduction of

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[68] This step is recognized and discussed in science shop literature. I will come back to it in the next chapter, where I will look at this transformation in more detail with respect to one particular collaboration.

vibrations in the working tools of dental technicians[69] in order to prevent occupational illnesses due to vibrations, that is, to improve their working conditions. We see that the demanding group was also composed of dentist professionals but that they were organized in an association who would guarantee some sort of public use of the results. At the moment of my visit, the process of the admission of the demand was already at an advanced stage. Having received the demand in 2006, the supervisor commented that he had since then spoken with a possible supervisor, an associate professor at DTU who did research in the field of the reduction of vibrations; that this professor had shown interest but would not be able to do the supervision before one year in time; and that they had already agreed to possibly offer it as a Master thesis. During the meeting I attended, strategies for defining the project were discussed and a mapping of the stakeholders was done, and a first meeting with the stakeholders was envisaged.

At the side of this pair of requests coming from professionals, I was able to follow a similar pair coming from public administration. I have already described the demand posed to the Science Shop by the public administration of Lyngby-Taarbæk concerning climate change relevant improvements of the administration's performance. Besides taking the demand to colleagues that could make emerge collaborations that would not be Science Shop projects as such, the Science Shop managed to take into the boat the mentioned ecologist group to form a consortium that would jointly pose the demand to the Science Shop. It was during my stay that a common definition of the scope of the collaboration was achieved and first projects were carried out.

On the other hand, a possible request from the public administration of Copenhagen about sustainable building materials was discussed. It had been submitted by a former student assistant of the Science Shop. Working at the Copenhagen administration as part of a sustainable building working group, she had identified in her working group a need for knowing more about sustainable building materials. She had wondered whether this could be a project for the Science Shop and turned to the Science Shop employee in order to propose it as such. The reaction of the latter was to advise her that the Science Shop could take the project only if it would come from an NGO, as it cannot accept demands posed by public administration, and that the topic would be discussed in the coordination meeting. During that coordination meeting, the Science Shop staff discussed which NGO they could recommend in order to make up a common project, or whether the knowledge need could be satisfied by

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[69] Demand 2006.008 of the Science Shop's archives.

other entities. I could thus observe a moment of brainstorming of contacts, especially by the coordinator of the Science Shop, which was quite similar to the one observed in the dentists' example described before, although more extensive as more information about the demand was available. So, also in these examples about requests coming from public administration, I had observed that the acceptation depended on the possibility of integrating some sort of community group and its concerns.

Finally, there were also discussions about a possible project about the location of a highway close to a day care institution. This project was problematic as it was not clear whether the group asking for the project was actually defending an interest which may impoverish the situation of other day care centers. The decision was still open when my stay at the Science Shop finished. The Science shop showed to be concerned whether the request showed a NIMBY interest[70] and esteemed necessary to dispose of more knowledge about the question before taking a decision. I will discuss in the next section the difficulty of evaluating requests with respect to possible 'NIMBY' concerns in more detail.

We have seen in the foregoing examples the active involvement of the Science Shop in the shaping of demands in order to adapt the groups and requests to the criteria. We have seen through the comparison of rather similar cases that one of the decisive factors is here the presence of a 'community group' in its widest sense within the demanders although the initial request may have been posed by an entity that does not respond to the criteria. This presence of a community group seems to be a means of attaching the process to an interest which goes beyond personal, professional, or institutional interests. In the next section I will discuss this assumption in detail.

1.3.3. Zooming in: The community groups of two research processes in the light of the criteria

In the next paragraphs, I will take a closer look on two particular collaborations facilitated by the DTU Science Shop in order to explore how far the community groups involved in them guaranteed the persecution of a wider interest. I will look on the one hand especially at how

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[70] The acronym NIMBY (Not In My BackYard), is often used (in a pejorative manner) for describing citizens' opposition to the locating of something considered undesirable (as a prison or incinerator) in one's neighborhood. As this concept mostly delegitimizes citizens resistance as being motivated by private interests, others have been developed that seek to recognize the legitimacy of the resistance as it does not only seek to impede a certain project in the own backyard but to oppose the project in general, as for instance the concept NIABY - not in anyone's backyard – suggests (Lober and Green, 1994). Resistance that would be directed towards challenging the proper framing of the problem and its solution, close to what some authors call neo-luddism (Jones, 2006) or new environmental luddism (Feenberg, 1999:82).

far the community groups may be considered as defending a kind of 'public interest', that is to say, how far they may be representative of 'civil society' as the different criteria want to guarantee (in particular the requirement of a non-commercial interest). On the other hand, the analysis of who uses the collaboration's results (especially related to the third criterion) will lead to discussing how the identity of the community group is linked to the Science Shop's goal of socio-technical change.

1.3.3.1. The community group in Vanløse

The first collaboration to be analyzed dealt with local urban planning in a Copenhagen district[71]. In the years 2004 and 2005, two CBR projects were carried out between the *Vanløse confederation of homeowners' associations* and the DTU. With the facilitation of the Science Shop, two groups of students carried out their Bachelor and Master's theses in response to requests brought forward by the community group. These requests concerned questions of local urban planning in the community group's district Vanløse, one of the villa quarters of Copenhagen. The community group members had made these requests because they desired to be able to participate more widely in local urban planning. They felt not sufficiently equipped when being offered such participation by the local Administration and hoped that the collaboration with the DTU would make them advance in this direction. As for the projects resulting from these requests, in the first year the students developed a more general analysis of how the district could respond at the same time to the challenges of urban renewal while maintaining its 'provincial' identity. This resulted in a number of proposals concerning traffic, urban space and commerce (Andersen, Gawronski, and Wätzold, 2004a/b). In the second year, the students focused on three vacant lots in the district's center whose imminent development was considered crucial for the district, and again generated proposals (Frølunde, Møller, and Nielsen, 2005).

On a first glance the community group and its requests fit neatly into the criteria. The demand of the Vanløse confederation of homeowners' associations did not show any commercial interest, the community group would not have had the resources to pay for a similar project or carry it out on its own, and the use of the results within the community group's activities was clearly defined. But when looking closer, we see that although non-commercial, the distinction between the *public and the private interest* in play is less clear. Similarly, although the use of

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[71] A more exhaustive description and analysis of this collaboration and in particular of its second project is to be found in the next chapter.

the results was well defined, we find a certain indefiniteness about the *identity of the community group* that would use the results.

Is the community group defending a 'public interest'?

Concerning the first point of the two, in the collaboration about urban planning in Vanløse the support to the community group followed the positive evaluation of their request in terms of serving the public interest: to improve citizen participation in urban planning is not only a non-commercial interest posed by a non-profit organization, but also a goal guided by a wider interest for improving democracy. But, in the eyes of the administration, the residents finally represent rather private interests, while the local government as the elected body represents the public interest [I11]. But is the private interest of the citizens clearly distinguishable of the public interest? I will offer in the following lines a discussion of the impasse produced by trying to locate the 'public interest' with certain actors in urban planning while attributing other actors a private interest.

To start with, the citizens' interests cannot be clearly defined in that opposition. The community group's members show a clear interest for their immediate environment defined by the outlines of their district. At the same time their visions for the district include also aspects that cannot be reduced to that (such as environmental concerns, especially visible in the defense of a humid area in one of the district's green zones, the Damhusen area).

In defending their district, their militant activity may sometimes resemble a NIMBY phenomenon, as in the case described by one of the members of the community group concerning their resistance to an infrastructure project in their district [I7]. The project consisted in creating a new access route to Copenhagen that would carry important traffic loads. It would affect the mentioned green area of the district with ecological value, so that the community group had good reasons for rejecting the project; but as a consequence of their successful resistance, the project was not abolished but changed in a way that will finally affect other districts. The NIMBY argument would point to the need of leaving decision making power to the local government because it is the local government that would care for an equal distribution of negative and positive effects of the planning decisions, counteracting the social differences.

This perspective corresponds to an interpretation of urban planning as a rational process. In this sense, the relationship between the citizens, the technical experts and the politicians as

the space where official urban planning is created may be described as a triangle (figure 2.3), where the relations between the different parties concern processes of information exchange and political representation. The role of citizens in local planning is determined by the relationships maintained between citizens and decision makers (politicians) on the one hand, and with the technical experts working for local administration on the other hand. This corresponds to the vision invoked by the finance committee [I11] when defining their relationship with the citizens and thus indirectly the role of the citizens: the local administration, both with its politicians and experts, is the legitimate representation of the local public.
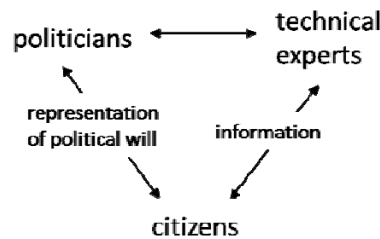
Figure 2.3 Urban planning triangle. Source: free adaptation from de Manuel (2005)[72]

However, this idea of rational decision making through the representation of the public interest via the administration has been shown to be an insufficient explanation of decision making in urban planning, as discussed by Flyvbjerg (2002) for the Danish city of Aalborg. STS literature on urban or land use planning has demonstrated the interplay of a diversity of actors and factors in the configuration of urban planning decisions (Aibar and Bijker, 1997; de Cózar and Sánchez García, 2004), amongst them obviously also economic actors and aspects.

This inevitable presence of economic actors in urban planning has in our case two 'faces'. On the one hand, there was one investor whose pharmaceutical, today multinational, company has its origins in Vanløse and has just recently moved out of the district. At the moment of the collaboration we consider here, the factory's owner still owned the factory site, which is located centrally in the district and became after the departure of the company available for new uses; in fact, this abandoned factory site was one of the three vacant lots that the students in the second project developed proposals for. There was a second investor of even

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[72] While the scheme is an adaptation of that offered by de Manuel (2005), the critique of the underlying rationalist perspective is not directed to de Manuel's interpretation, as the figure is taken out of context.

higher importance to urban planning in central Vanløse, who built the culture house which was finished in 2005 and is now developing several of the sites dealt with by the students in the second project. Both investors were important partners for administration in deciding planning issues.

The consideration of the role of the investors destabilizes the triangle perspective: where to place them? Are they just other citizens or something else? How do the economic actors in the district integrate themselves in the dynamics of delegation and accountability, of representation and responsibility? The city is not only a "habitat", but also an economic good itself. Urban spaces are defined between the private and the public. The definition of what is a private issue and when it becomes public is a constant topic in urban planning, as well as its framing in regulations and norms of administrative law and urban planning specific regulations. The frontiers between the public and the private, and accordingly the roles for certain 'public' and other 'private' players, are not at all clear in the case.

In fact, in our case, the Administration and the community group disagree on some of these definitions. This is most visible in the critique of the building regulations for the district by the community group's members. The citizens consider the valid regulations as outdated or insufficient, as there are many areas in the district that lack an updated local plan (local plans give the most detailed planning specifications in the hierarchy of planning documents in Copenhagen). They believe that especially in their district this supposes a problem as the residential character of the district is menaced by the city's growth, becoming exemptions to the outdated regulations the rule. Administration is less preoccupied with this and more focused on developing the *district plans*, which are less detailed than the local plans but serve to establish a certain coherence in planning within the districts. To cover all Copenhagen with updated local plans would be a too time intensive task.

Copenhagen's Administration has shown in the last decades to be aware of the need for experimenting on the forms of representation taking place in local urban planning. The most recent experiment in this sense has been the creation of a sort of hybrid space in a kind of 'amplified triangle', between the 'normal citizens', the politicians, the technical experts and the investors. This innovation, that used the Vanløse district as one of three sites for testing the idea in form of pilot projects before generalizing the initiative to whole Copenhagen, consists in the integration of a new figure into district planning: that of the recently nation-wide created 'local councils' as an new institutionalized representation of local civil society[73]. I will

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[73] While local councils have been introduced into the local configurations of urban governance, their participation in

describe the role of this relatively recent figure in local urban planning in some more detail, as it will be relevant for the discussion in the next section of who has been the principal 'user' of the collaboration's results. Before doing so, I will give a brief characterization of Vanløse's Local Council.

According to the frame given by the municipality's mandate (Københavns Kommune, 2007), the local councils consist of elected representatives of every local organization that wants to be represented in it, under the condition that the organization should have at least three members and have an elected representative. It also includes a number of local politicians that represent the different political parties present in the district. In the Local Council of Vanløse, we count in 2007 seven representatives of political parties of a total of 23 members. The mixture of political and associative representatives is not free of tensions[74]. The Vanløse Local Council does neither include representatives from immigrant organizations (while the guidelines determine two seats for them) nor from religious groups – the former because there is no such organization in the district, as this has a quite low share of immigrants, and the latter because the religious institutions in the district don't show social activities, which is a criterion for selection. It lacks also representatives from parents' associations, who in spite of being considered an important ingredient to the Local Council do not participate due to their lack of time. The formal design of the Local Council makes it an intermediary between the general public of the district and the institutions of representative democracy. The Local Council has a set of rights and duties towards the administration in this sense, and a yearly budget to finance its expenses (being the members' work voluntary), that should be directed towards "transversal, district related, dialogue creating and networking activities for citizens and users in the local environment" (Vanløse Lokaludvalgt, 2007). In 2009 the budget for the Vanløse Local Council was 2.5 million Danish kroner, which is a bit less than 336 thousand Euros (Vanløse Lokaludvalgt, 2009). The Local Council's glossy brochure shows in its design its 'institutionalized side'. At the same time, there are different groups and formats within the local council. It is organized in working groups on specific topics (urban planning, children and young people, democracy and information, culture, environment and traffic, and social environment) that go sometimes close together with the activities of specific organizations that are linked to the Local Council. For instance, the Agenda21 group or the group working on

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urban planning is not a generalized feature and the specific object of the here described pilot projects undertaken by Copenhagen's municipality.

[74] This and the following information dates from an informal conversation when I attended a meeting of the Local Council the 8th of June 2008.

the green area Damhusen are closely linked to the Local Council's activities in environmental aspects. As a consequence, during the interviews I got sometimes the impression that there were many names for the same groups – or, to put it in another way, that the space created by the working groups in the Local Council is filled up with the activity of the before existing associations or activist groups of the district. The use of communication through Internet illustrates the way how the Local Council institutionalizes the associative movement in Vanløse at the same time as the associative life maintains a certain independence; for instance, the website principally used by the Local Council's members is not the official website of the Local Council (which is stored at the municipality's server: www.vanloeselokaludvalg.kk.dk) but one that does not pertain officially to any organization in the district (www.vanloese.dk).

So, the municipality's pilot project consists in integrating the local councils of three districts, amongst them that of Vanløse, into local urban planning by making these local councils elaborate their own district plans. This should be done according to a number of guidelines given by the municipality. These district plans, presented by the municipality as a step towards grassroots democracy (Københavns Kommune, 2006), do not have any economic or legal competences associated to it: legally binding are the local plans (concrete prescriptions that exist for some spaces in Vanløse but not for the whole area) and the municipal plan (Kommuneplan). The district plan is situated between them regarding the question of scale – it concerns a bigger area than the local plans and a smaller regarding the municipal plan. So whether the plan would be executed entirely or also in parts depends according to municipality on the degree of realism of its proposals [I11]; the chairman of the Local Council hopes that it will be *politically* binding.

The identity question: Who uses the results?

Concerning the *identity of the community group*, this seemed to be rather undefined in the Vanløse collaboration. In my exploration of the case, it appeared actually in the beginning rather difficult to capture. While the counterpart for the students was the Vanløse Grundejersammenslutning (the district's confederation of homeowners' associations), the results of the collaboration are being used by the Local Council of the district, which had been created in 2005, the year of the second project. As pointed out earlier, this Local Council counts with financial resources that would probably have made the decision whether the community group fits into the criteria more difficult.

But more importantly, we see that any delimitation of a particular identity of the community group would be in vain in our case. The three persons that were the contact persons for the students are members of both groups. Moreover, the interviews showed the relevance of other environments of these persons as relevant for their performance in the collaboration, be it the influence of their professional experience or their affinity to ecological ideas and groups. In this sense, one of them pertains to the consumer group of the Copenhagen waste management company R98, while another was working at the Danish association of municipalities (Kommunernes Landsforening) on urban planning questions.

So, the members that collaborated with the students cannot be identified with a particular movement for change in urban planning in Vanløse but rather with a number of groups involved in the question. In this sense, my interviewees understood their role (and with this that of the Local Council) as intermediaries with the district's residents that they want to represent and to engage into its activities, a goal for which strategies for public engagement would be needed (as for instance to go "on the spot", i.e. seek to connect to mobilization around very specific issues). They understood it equally as a responsibility for a kind of general interest that would not necessarily emerge from the involvement of more residents, which could also be called "the wider interest", in form of ecological considerations, social justice issues and alike.

In conclusion, the question *who* would use the results was neither sharply defined during the collaborations nor afterwards. This seems to be rather normal: it is obvious that representatives of a particular community group may be simultaneously engaged in other groups; and it is also obvious that community groups change over time. Their possible role for some kind of positive change in urban planning was not predictable. The discussion shows this way that while the Science Shop applied the criteria for selecting the community group, to judge their actual fulfillment would be a hopeless undertaking. The case shows moreover that the DTU Science Shop is not interested in using the criteria in this sense.

1.3.3.2. The counterpart in the collaboration on carsharing

The Science Shop has carried out in the past a number of projects with Copenhagen Carsharing, and has been in fact involved in the very beginnings of this initiative and has maintained contact since then. In 2005 and in 2007, two groups of U.S. American exchange students carried out projects in response to requests made by Copenhagen Carsharing (in 2005) and by the Danish carsharing umbrella organization Danske Delebiler (in 2007). The first project investigated possible improvements of the association's booking, billing, and car access

systems, as the systems in use proved insufficient for the needs of the management of its rapidly growing membership. They elaborated a comparison of different smart-card systems[75] available for carsharing clubs which served for the association as a basis for further investigation that led to the final implementation of such a system in 2007. The second project responded to an interest of Danske Delebiler to incorporating high-efficiency, low-emissions vehicles (hybrid and alternative fuel cars) into the carshare fleets to reduce air pollution. The students collected data about use patterns of carsharing users and non-users in order to determine the possibilities and conditions for an integration of these car types and concluded that a change in governmental tax policy would be needed for such a measure. The results of the reports were considered useful by the member organizations primarily for the data on the use patterns that proved interesting for their strategic potential.

Again in this CBR process, the community groups did apparently not pursue a commercial interest, the expected results could be judged usable by the community group, and being non-profit organizations, they could be assumed not having the resources for paying a similar service. But again, it proves fruitful to dig a bit further.

Does the community group represent citizens or users?

Carsharing is a concept that developed from sharing private cars (in families, neighborhoods) to installing a kind of "community" carsharing. The idea of making private cars a shared good is in principle not necessarily linked to any business idea; nevertheless, the growth of the carsharing organizations leads usually to the integration into the market when a certain size has been reached. In the development of carsharing in Switzerland, the growth had posed the controversial question of which approach would be more suitable: the community or the business approach (Truffer, 2003), that is, whether to emphasize the associative character and the voluntary engagement of the members in the organization or the market integration and the reliance on *users* rather than *members*. As in Switzerland this is also in Denmark a difficult decision. Whereas in Switzerland finally this conflict has been resolved in favor of the business model (ibidem), in Denmark a hybrid form is being invented, as I will explain in the following lines.

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[75] A smart card is a small plastic card that has a built-in microprocessor to store and process data and records. In carsharing systems smart cards are used by the members to have access to the car upon reservation. The card opens the vehicle and unlocks the ignition.

In some moment in the growth curve, the members of carsharing become users. In Copenhagen Carshare, the number of volunteers was large in the beginning, and the personal involvement of at least some of them was very high. In fact, the first employee could in the beginnings probably better be described as a volunteer herself, as she had to create her own working place, and did literally everything: cleaning the cars, repairing them, doing the invoices, attracting new members and integrating them into the organization [I14]. Gradually, a differentiation of the roles among members occurred and professionalization advanced. While in the beginning most new members also did some form of volunteering in the organization, today the percentage of volunteers is much lower and an important part of the work is carried out by the employees whose number has increased to about five persons, at least two of them full-time employed. Also the decreasing percentage of members attending the annual general assembly is a sign of the shift from members to users: in 2007 the annual assembly was attended by 10 percent of the members – not at all sufficient in the eyes of the initiator of Copenhagen Carshare, who thinks about the need for splitting the association up into local groups in order to achieve smaller group sizes again [I12].

The interest of the second students' project for the Danish carsharing umbrella organization illustrates that this change lies in the very heart of carsharing. As described before, in this project the students explored the *use patterns* of the members of the Danish carsharing associations. Carsharing organizations need to be concerned about use patterns, about the needs and preferences of their members and of those that are not members yet. In order to grow and achieve broad implementation, marketing needs to be done for making the product known, and membership has to be made easier (both becoming a member and being it) – the personal involvement has to be reduced. But reducing the personal involvement brings the organization closer to the business model. In fact, all interviewees coincide in the diagnosis that the members of Copenhagen Carshare are not really different in their ideological orientation from the members of Hertz Carshare (the other carsharing organization in Copenhagen), but rather in their needs and financial resources, which seem actually to be the decisive driving forces in the choice of becoming member of one or the other organization. The recent creation of a fund between Copenhagen Carshare and Aarhus Carshare (mentioned in the beginning of the chapter) is intended to be a means of improving the services these non-profit organizations offer to their members in quality and price at the same time as it may allow to maintain the community model in a way that otherwise would be impossible. By translating the business part to a separate entity, the two organizations aim at a hybrid model between the community and the business model.

In the case of the second project within this collaboration, the question for the kind of interests the community group represents becomes even more interesting. As mentioned before, the counterpart of the Science Shop in this collaboration was the Danish Carshare umbrella organization. As described before, this organization consists principally of non-profit carsharing associations but also comprises the company Hertz. Its work benefits thus also a certain profit orientation - although carsharing in Denmark does not bring at the moment too much financial benefit for its operators or produces even losses [I13, I14], it shows an important *market potential* [I13]. The definition of the second project and the use of its results touched this aspect, as the project implied an analysis of market relevant data. The strategic relevance of that kind of data for the members of the umbrella organization made the disclosure of the analysis undesirable for them in the context of business competition. This competition is determining particularly the relation between Copenhagen Carshare and Hertz Carshare, although they have a slightly different market focus [I13], which becomes apparent in Hertz's "fancier" high-tech concept through the use of smart cards - which actually Copenhagen Carshare is also heading to – but also in a bigger emphasis of Hertz on a good maintenance and cleanliness of the vehicles, as well as a higher price. In this context, user data such as mobility needs, the kind of journeys done with the cars, preferences concerning cleanness, comfort, or the acceptance levels of walking distances to the shared cars, become highly relevant.

The identity question: Who is using the results?

In this case, the identity of the counterpart seems on a first glance to be clearer as in the Vanløse collaboration. Nevertheless, when looking closer, we find also here a certain unconcern for who would be the counterpart in the collaboration. Of course it was clear that the counterpart in the first project would be Copenhagen Carshare and in the second one the Danish carsharing umbrella organization. But when looking closer at the step from the first to the second project, it becomes clear that the primary concern lied in supporting the topic and not so much a particular community group. Copenhagen Carshare had rejected in two consecutive years a follow-up project to the first one because they felt that they did not have the resources necessary for it. Nevertheless, the Science Shop maintained the dialogue with the contact person in Copenhagen Carshare about the possibilities of a follow-up. Then, in the second year after the first project, this contact person had changed to the competitor Hertz. Being a company, it was not eligible as a counterpart for a Science Shop project. But this same

person was also member of the board of the carsharing umbrella organization. It was in the dialogue with her that the idea emerged to "lift it [the project] over in that umbrella organization" [I2], so that finally an appropriate frame for a follow-up project was found.

We see in this case moreover once again that maybe rather than *excluding* certain groups that would not meet the criteria from the range of possible partners in a CBR project, the Science Shop is concerned with always *including* a group that in its eyes may be interpreted to meet the criteria.

1.4. *Preliminary conclusions on the democratic significance of the selection criteria*

In the very beginning of this chapter, the extract of the interview with the Science Shop's coordinator has led to three guiding questions for the analysis of the criteria's meaning for science shop work, asking for the nature of the interpretative work involved; for the motivation underlying the use of the criteria; and for the understanding of socio-technical change associated to them. The analysis of the kind of community groups and requests finally accepted, of the observations of the qualification process leading to acceptance or not, and in particular of the two particular community groups allows to make some points about these questions.

To start with the question for the interpretative work, the maybe most interesting aspect observed concerns the *uncertainties about where to situate the community groups and the requests on the line between the private and the public*. We have seen that the criteria of a 'non-commercial' interest and of the demanding group not having the resources to access university research via the conventional ways are employed in order to help the Science Shop to identify those groups and requests that would represent the mentioned 'civil society concerns'. And we have seen that they fulfill this orienting role in a limited way – the criteria do not give clear and sharp demarcations; they do not explain the decision making process but rather need to be constantly explained by the Science Shop. Can the Copenhagen Carsharing be qualified as a non commercial undertaking? Which interests do the three members of the Vanløse community group represent – their district's interests, the wider interest, or their private interests? Can we make a difference between public administration bodies in general and the staff of a kindergarten belonging to and financed by public administration, admitting the second but not the first? The analysis has shown that there are no true and single answers to these questions: the commercial and the non-commercial, the 'private' and the 'public interest' cannot be neatly distinguished. We have seen also that then, rather than determining

the decision, the criteria are in need of being explained; the Science Shop is constantly called to explain and perform what 'civil society concerns' should mean.

A second point concerns the motivation of the Science Shop in the use of the criteria. The analysis has shown a certain disinterest on the side of the Science Shop towards the identity of the 'community groups' that it collaborates with. The discussion of the application of the criteria shows a primary concern with evaluating the *request* rather than the group bringing it forward.

At the same time, and this is the third point to be made here, we have seen that the Science Shop considers very important the *presence* of such a community group, but in a rather instrumental way. This last point makes us aware of an important ingredient to the Science Shop's perspective on how its CBR should be able to contribute to socio-technical change (our third question posed in the beginning).

These three aspects confirm the initial skepticism towards the explanatory potential of the strong democracy perspective with regard to the DTU Science Shop's work. In the following second part of the chapter I will present an alternative democracy perspective and explore its explanatory potential for the discussed features of the Science Shop's work.

2. SCIENCE SHOP WORK AS 'ISSUE ARTICULATION'

2.1. *Issues as occasions for democratic dynamics*

From the three points mentioned before, especially the observation of the Science Shop's concern with the requests rather than with the community groups that bring them forward gives the starting point for our further discussion. It shows that the Science Shop's perspective on the democratization of science and technology may be interpreted as one that does not focus on social groups as the crucial entity in democracy questions. Although they definitely play a role, this may be a secondary one.

Marres (2005, 2007) and Latour (2007b) offer here an interesting alternative democracy perspective by asking how *issues* are related to *publics* – they argue for putting the "issue" in the center of analysis instead of focusing on democratic *subjects* (that is, human groups), and allow thereby for asking for the publics that these issues generate[76]. Marres and Latour base

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[76] We find such a perspective on democracy well developed in the realm of actor-network theory and its environments under the notion of *technical* or *dialogical democracy* (Callon, Lascoumes and Barthe, 2001). I will

their argumentation on Dewey's work on issue formation. A work which has not been sufficiently appreciated according to Marres, in spite of his wide recognition as an important contributor to the theorization about democracy from the pragmatist perspective, which she describes as follows:

"Dewey's critique of modernist epistemology and his commitment to democratic public debate have had strong influence on American post-analytical approaches in philosophy (Rorty, 1982; Bernstein, 1985). Indeed, he is widely regarded in political theory as the 20th-century philosopher who most strongly realized the value of dialogue for democracy in post-industrial societies (Westbrook, 2005). Dewey has also been declared a philosopher of 'ecological modernization' avant la lettre; sociologists such as Ulrich Beck regard Dewey as the first to recognize the central importance of the 'harmful indirect consequences' of industrial life as an object of governance and public involvement (Beck, 2002; see also Thompson, 2002). Finally, Dewey is appreciated as the theorist who introduced a 'spirit of experimentalism' into the study of democracy. He was the first to establish the importance of innovation as an enabling condition for, as well as a feature of, democratic process (Keulartz et al., 2002; Dratwa, 2003). These different aspects of Dewey's work, its emphasis on deliberation, his experimentalism and sensitivity to 'risk' issues, are also implicitly or explicitly taken up in STS research (Latour, 2001)." (Marres, 2007:765,766)

According to Marres, in order to appreciate Dewey's underestimated work on the formation of issues, we have to consider it in its relation to the work of another American pragmatist, a contemporary and interlocutor of Dewey, Walter Lippmann. With her account of the *Lippmann-Dewey debate*[77], Marres argues for a new interpretation of Dewey's and Lippmann's thinking. Usually the Lippmann-Dewey debate is viewed as "a conflict between two normative positions on the possibility of democracy in technological societies: Lippmann's sober democratic realism versus Dewey's ideals of participatory democracy" (Marres, 2007:766). However, Marres suggests that it "can also be interpreted as an attempt to move the debate about democracy in industrial societies beyond the opposition between technocracy and

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concentrate on the following pages on the theoretical development as offered by Marres which however is closely related to the first and partly builds on it, but will refer later on also to these authors.

[77] The Lippmann-Dewey debate is a reference widely discussed in political theory which refers principally to three books: "John Dewey's only book on political theory, The Public and Its Problems (1991 [1927]), was written in response to two books by the journalist and public intellectual Walter Lippmann: Public Opinion (1997 [1922]) and The Phantom Public (2002 [1927]). All three books discuss the fate of democracy in technological societies, and they have received widespread recognition in political theory as the Lippmann–Dewey debate (Ryan, 1995; Putnam, 2004)." (Marres, 2007)

public participation" (idem). In spite of their differences both authors express similar ideas concerning the way how increasingly technologized societies may answer democratic challenges. Both diagnose the moments when democratic institutions fail to deal with certain problems (deriving for example from new scientific and technological developments) as decisive moments for the enactment of democracy, where *the public* is challenged to find new answers for solving those problems. Controversies provoke the renewal of democracy. Or as Lippmann puts it in his book 'The Phantom Public':

> "[I]t is in controversies of this kind, the hardest controversies to disentangle, that the public is called in to judge. Where the facts are most obscure, where precedents are lacking, where novelty and confusion pervade everything, the public in all its unfitness is compelled to make its most important decisions. The hardest problems are problems which institutions cannot handle. They are the public's problems." (Lippmann, 1993 [1927]: 121)[78]

Moments of controversy are characterized by uncertainty. There is no established and unique expertise that can deal with such problems, on the contrary the established knowledge proves insufficient[79]. Lippmann gives with that an idea of how issues provoke the need for democratic dynamics beyond the institutionalized ones.

Also our cases deal with such 'issues'. In the carsharing case, the 'institutionalized' mobility model in Copenhagen, which is far from being the worst in comparison to other European metropolis, shows to be nevertheless controversial in how well it solves the need for mobility of the city's inhabitants and visitors. There is no perfect technical solution to this neither visible in planning documents nor in the head of the experts concerned with traffic planning in Copenhagen's City Council. It is moreover a question that goes beyond specific fields of expertise. Apart from traffic planning, it is also necessary to consider the city with its multiple functions, the health impacts produced by different means of transport, their environmental impacts, and so on.

Dewey provides a point of departure for imagining how this on a first glance disillusioning picture of a hopelessly wide array of types of knowledge needed for attacking such an issue can be considered, in a pragmatist way, as an opportunity for democratic dynamics. Issues

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[78] An affirmation that at the same time as it may serve to fundament the approach to democracy here exposed, goes also in a line with liberal thinking, as it gives ground for arguing that the state should not interfere in those issues ("the classic liberal idea of limiting opportunities for public intervention in private affairs", Marres, 2007:767), which is nonetheless not the direction neither the cited authors head to nor myself.

[79] A similar observation on the role of uncertainty underlies the notion of 'postnormal science' as coined by Funtowitz and Ravetz (1992).

mobilize such democratic dynamics by creating publics around them, as a consequence of the affectedness they provoke:

"When a family connection, a church, a trade union, a business corporation, or an educational institution conducts itself so as to affect large numbers outside of itself, those who are affected form a public which endeavors to act through suitable structures" (Dewey, 1991 [1927]: 28–29).

Returning to the disputed situation of mobility in Copenhagen, the unsatisfactory treatment of the issue by the institutions provokes the emergence of 'publics' that are affected by it. The carsharing association is not the exclusive public of the issue but shares the stage with a whole set of different actors who have become engaged with the issue – or *attached* to it, to use Marres' language, who draws from Gomart and Hennion (1999); this attachment consists in "being actively committed" to the issue and in "being dependent on" it[80]. So it is not only the carsharing association that is 'attached' to the issue, but also possibly a wide range of other actors which are brought into new associations by the issue, as for instance the local Administration's planning, Copenhagen's many users of public transport and private cars who may show very different motivations for a common interest of having less cars on the streets, but also the multinational car renting company Hertz, car manufacturers, legislators, etc. Issues require an articulation of those *joint but also antagonistic* attachments (Marres, 2007), in order to getting closer to a settlement.

Marres clarifies that while Lippmann and Dewey seemed to consider those issues as finally solvable if only the right answer is found, current STS approaches "break with this assumption of possible mastery" (2007:768). Democratic politics should not be misunderstood as "problem solving" (which would reflect a managerial vision of politics, while articulating antagonistic affairs precisely means to not sidestep conflict). It is therefore that she prefers the term *issue* to speaking of *problems* as Lippmann and Dewey did. To speak about issues means thus to speak about situations that may promote the mobilization of publics and enact democracy in new forms, but that do not promise the settlement of the controversy. Instead, it needs to be recognized that democracy itself is controversial and the enactment of democracy through the mentioned publics will most probably again show shortcomings that impede the definite

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[80] This attachment is close to the *'concerns'* that are highlighted in ANT's analyses of the dynamics of patient groups who engage in knowledge creation processes about their diseases (as Callon and Rabeharisoa, 2008, describe in relation to the French Association of Neuromuscular Disease), as well as to what Feenberg (1995, 1999) defines as *'participant interests'*. Both notions point to the fact that rather than "social groups" bound together by ideological affinity, social status or similar characteristics, it is the issue itself that is the common ground for action.

settlement of the issue. So while it is desirable to achieve a closure of the controversy and a stable settlement of the issue, Marres and also Stirling (2005, 2008) emphasize the opening up of the issue articulation as a democratic quality[81]. In this sense, Marres opposes the 'public-ization' of issues versus their 'privat-ization', being the former equivalent to the opening of a conflict and the inclusion of antagonistic actors, while the latter occurs when the conflict is "sidestepped".

Let's see how this theoretical perspective may be applied for making sense of the qualification work of the DTU Science Shop.

2.2. The DTU Science Shop's qualification work in the light of issue articulation

2.2.1. The demand-driven approach as a mechanism for getting access to issue-publics dynamics

The different examples given in the first part of the chapter have shown the Science Shop's interest in getting access to dynamics of social mobilization for positive change – which we could call issue-publics dynamics according to the before exposed theoretical framework. We have seen that the Science Shop disposes of different ways of getting *knowledgeable* about the civil society concerns it wants to make the different actors of a CBR project work on. The general approach, corresponding to what is often called the demand-driven approach, is to locate the issue 'detection'[82] with the community groups (or individuals) – with that sort of 'public' that is defined by those difficult lines of demarcation discussed in the first part of this chapter (non-commercial, not having the resources, being able to use the results). We have however seen that issues may be raised also by public administration or by the Science Shop itself, that is, not from the specific 'public' of the Science Shop addressed by its access criteria. There is thus an additional "rule" which says: the issue may be brought up also by other actors, but the articulation process needs to include the Science Shop's specific public. At the same

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[81] In some moments, this emphasis on the opening may give the impression that a good democracy would be one without closures at all. This does however not seem to be the meaning attributed to it by Marres and would obviously neither be very realistic, as decisions (closures) are not unavoidable but also a necessary ingredient to democratic process. The concern for an appropriate balance between moments of opening and closure is even more obvious in innovation-oriented participatory mechanisms, as closures are a necessary and at the same time critical part of any process of technology development (the term 'closure' has been introduced in this sense in STS literature in particular through the "social construction of technology" approach, see Bijker, Hughes and Pinch, 1987). I will discuss this question in chapter five in more detail.

[82] See below for a comment on the epistemologically realist connotation this word carries with it.

time, it seems to be nevertheless important for the Science Shop that the main part of issues would be brought forward by community groups.

We have seen also that the qualification of a request intervenes importantly in the shaping of the request and that the Science Shop is conscious about this. This shows that the process of becoming knowledgeable about issues cannot be understood as a kind of discovery as the word 'detection' implies; this realist perspective does not explain what the Science Shop is doing. Instead, the Science Shop seems to employ a pragmatist perspective that acknowledges that the issues that the Science Shop gets hold of are very much shaped by the proper qualification process.

The hybrid character of the two ways of getting to the issue (demand-driven or proactive) becomes apparent in the moments where the Science Shop initiates projects from a broad general interest of a community group, as is the case with KMEK. The Science Shop would organize here typically a meeting or workshop with some researchers and members of the common group, so that a common creative process may take place. The determination of the issue to be dealt with is here a shared process, although motivated by the community group and related to those concerns that motivate the community group's existence. As the Science Shop counts moreover with own research capacity, the definition of its own research topics may be inspired by the incoming demands. Farkas (2002:88) describes such a mechanism in a more formalized way as being done by the unfortunately today not anymore existing Nijmegen Science Shop. Its "thematic groups" (who attended the demands by topics) counted with a budget for carrying out own research which they defined inspired by the incoming demands[83].

The definition of the issue may happen thus in varying forms located somewhere between the demand-driven and the proactive approach, and it is always a process where the Science Shop is actively involved. The DTU Science Shop locates the 'detection' of issues only on a first glance with a specific social group (civil society organizations, or those defined by the criteria). Although the kind of 'inversed transfer' paradigm has been a guiding vision in the beginnings of the science shop movement[84], at the DTU Science Shop as at many science shops today the

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[83] "Each year the thematic groups have a budget to hire a professional researcher to carry out research. They each formulate a project "from their reflection on what is relevant based on the questions they get and the societal issues in their field they determine from following social and scientific literature and debates" (Fokkinga 2001). Projects must meet the general science shop criteria and receive approval from the thematic group coordinators and the science shop Advisory Board. Such projects then enter the "Science Shop Pool" (Wewi Pool Projecten)." (Farkas, 2002:99)

[84] Inversing the traditional direction of knowledge transfer, it is here the community groups that feed into university research. The failure of this kind of realist perspective in guiding science shop practice has been pointed out by

places of issue definition are diverse, and their co-shaping is acknowledged[85]. They are however always connected to the dynamic of community groups, which is a basic working principle of the Science Shop.

2.2.2. The qualification of demands: the extraction of the public from the private

We have seen also that the Science Shop's evaluation of incoming requests showed a concern for qualifying them with regard to their *potential* of being related to some kind of mobilization for change. The examples have shown well the shaping of the requests so that they would fit into the criteria; we have seen that although a request may seem on a first glance to be 'private', it may nevertheless show some public potential that the Science Shop considers possible to promote. Also this aspect seems to be in line with the pragmatist perspective on democracy as outlined before.

The examples given illustrate that in the qualification work of the Science Shop, the 'public' and the 'private' is not an opposition. We could speak of an intent of making a distinction between a kind of 'private' and a 'public' concern that is not equivalent to the distinction of the 'public interest' (as represented for instance by public administration) and the 'private interest' as those of the citizens. The emphasis on the *presence* of a community group in any collaboration may be interpreted as an interest in Dewey's 'publics' - publics which are not *opposed* to the private but which are mobilized around *concerns* claiming for a different treatment of the problem. The Science Shop's practice shows that it considers that the private may have a potential of becoming public, as the accepted demands show. A potential that the

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Farkas (2002:208), citing Valenduc and Vendramin (1995):

"Many investigations were founded on an implicit belief that civil society had a 'latent social demand' for research. The generally accepted hypothesis was that social groups and individuals had a large number of questions of a technical and scientific order, revealing the existence of a gap between academic knowledge and practical requirements… This approach to the relationship between science and social demand can be roughly outlined as follows:

- There is a "latent social demand" which is simply waiting to surface but needs adequate structures to allow it to do so.
- There are also scientists who are willing to leave their ivory towers and meet this demand, once they are made aware of the social interest of their work
- The types of interfaces needed between research and society are therefore meeting places and mediation procedures."

[85] In consequence with the earlier made distinction between the 'request' and the 'demand' we could arrive at a new interpretation of the very concept of the demand-driven approach in contrast to a maybe better-called 'request-driven approach'. The difference would lie in the underlying motivation: is it the connection to issue-publics dynamics that matters or the fidelity to the community group (that is assumed to express civil society concerns)? I will come back to this discussion in chapter five.

Science Shop seeks to promote when accepting a demand. When doing so, its intended role may well be described as one of a support to the *extraction* of the public from the private, towards the earlier described public-ization of private issues.

We can see that the public and the private are thus not qualities of an issue but precisely a matter of qualification, which corresponds to the pragmatist perspective proposed by Marres. This may be better explained proposing first a misleading interpretation of Dewey's perspective on the private and the public, where a problem would be public if it affects more than those actors directly involved in it. This definition, that presents the private and the public as given *qualities* of an issue, would oblige us to say that finally everything is public, as even the smallest act or also non-act has consequences that go beyond those 'directly involved' – an insight that has become a common place with the famous notion of the butterfly effect. If the distinction between the private and the public is meant to have any analytical potential, this needs to be understood as emerging from the evaluation of the consequences of an act or a situation, rather than as qualities that would exist beforehand:

"When indirect consequences are recognized and there is effort to regulate them, something having the traits of state comes into existence. When the consequences of an action are confined, or are thought to be confined, mainly to the persons directly engaged in it, the transaction is a private one." (Dewey, 1991 [1927]: 12-13; italics are mine).

The public is not a normative category. It is not necessarily a positive category, such as the private is not a negative category (ibidem). The normative dimension is rather contained, as Marres shows well, in the public-ization of an issue. Making an issue public means pointing to the need for public control, to the need for public institutions to handle it.

The Science Shop's practice shows an application of such a pragmatist perspective. This became especially visible to me in one conversation, when the Science Shop's coordinator emphasized to me that the employment of the criteria would not imply any moral judgment on the community group. There is no moral judgment possible; at the same time, as a situated actor there is obviously a pragmatic judgment involved in accepting or denying requests according to whether the Science Shop considers that it can or cannot promote their public potential. The discussions in the Science Shop's coordination meetings deal with selecting those demands where a Science Shop project is likely to promote the public potential.

This judgment on the possibility of contributing to the public potential of a request is bound to whether the Science Shop considers the request to show a potential 'knowledge need'. The Science Shop responds to those requests that it considers to contain such a knowledge need

linked to a will for public-ization – otherwise the request may be handled either by directly giving advice or referring the request to a place where it may be helped[86].

We have seen in this section that in the qualification of incoming requests the Science Shop's practice seems to correspond very much to the democracy perspective outlined by Marres. The Science Shop shows to be interested in the issue and in supporting its public-ization rather than in giving a blind support to the community groups. I will analyze in the next chapters whether this interpretation may be extended also to the Science Shop's facilitation of collaborative research processes. In order to do so, it may be helpful to outline first what it would or could mean to follow in this facilitation the perspective of issue articulation. This is what the remaining part of this chapter is concerned with.

2.3. Guiding questions for the analysis of the DTU Science Shop's promotion of community-based research

In order to inquire the DTU Science Shop's promotion of community-based research processes in the light of the issue-centered perspective, we may seek inspiration in the STS background that Marres' perspective builds on.

As noted earlier, Marres' use of the term 'issue articulation' allows her to go beyond Dewey's problematic "objective definitions of public affairs" (Marres, 2007:768). She makes the link to STS literature and particularly to actor-network theory in order to conceptualize a pragmatist democracy perspective that takes into account the 'constructed' nature of an issue. This STS fundament allows to conceive of two lines of questions for the analysis of the DTU Science Shop's facilitation of CBR processes: first, how we may conceive of the particular democratic effort contained in CBR as promoted by the Science Shop. Inspiration can be taken here from the concept of *technical* or *dialogical democracy* as developed in particular by Callon et al.

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[86] As Farkas (2002) points out, these activities make out a significant part of the work of many Science Shops: "Many projects never reach this stage and are finished off with advice or a referral. The science shop does not see this as a failure: their goal is to help the client and to keep a critical perspective on what science can and cannot achieve for client groups. The negative consequence of advice-giving, however, is it does not lead to research. This can be significant because measures of science shop success include the number of students who receive academic credit for science shop research and the number of reports published. Dobbelsteen explained the need to resolve this dilemma:

"The science shop has been giving advice for as long as it has existed. To us, it's just as important as doing research, because we give the client immediate assistance for free. The problem is advice has always been undervalued here— you can't really say much of anything about advice. You might write a letter or make a phone call, but there is no report, no product. We need to make this aspect of our work visible. (Dobbelsteen 1999)" (Farkas, 2002:109).

(2009)[87]. Second, we may ask how the Science Shop's role in this may be understood. We will be here interested in the distinction between *intermediaries* and *mediators* as outlined by Latour (2005).

2.3.1. The democratic effort involved in community-based research

When looking at the facilitation of CBR processes as issue articulation we would ask on the one hand what is or should be articulated and how this is being done.

We have seen that the issue-centered perspective holds that a democratic intervention on issue-publics dynamics would consist in articulating joint and antagonistic actors. The goal is to promote the *opening* of the issue in terms of an exploration of associated claims about the issue made by the involved actors and things. Such articulation would mean to take the issue's exploration as a double work on the closely intertwined dimensions of knowledge and identities (Callon et al., 2009). This opening could however not make sense without a certain will for closure, as no democracy may work with an imperative of constant opening where no decisions are allowed (ibidem).

Now, the Science Shop chooses to engage with particular community groups or individuals. These may possibly be considered *part* of the variety of publics emerging around the issues they bring forward. We may then ask for the *role of this attachment of the research to these community groups*: how far the collaborative research process sticks to the community groups and their goals, and how far and by what means it searches to explore the multiplicity of attachments in the light of the uncertainty about the right way to settle the issue in question.

2.3.2. The mediating role of the DTU Science Shop

When analyzing the articulation efforts in the CBR processes, we would need moreover to look at how the very identity or role of the Science Shop is conceived and performed. The analysis given in this chapter shows that the Science Shop is maybe not so well described as a sort of 'intermediary' which would merely 'connect' the community groups and their issues with actors at university who could help. Both notions, that of intermediary and that of connection, give an impression as if the Science Shop itself would on the one hand just join what already exists, and on the other hand, as if it would do all that very much like a catalyst – the intermediary leaves the process in the same condition as it went into it. In the examples analyzed, we have seen that none of the two points apply to the Science Shop's performance.

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[87] For an earlier discussion of the notion of 'technical democracy' see also Callon (1998b).

First, the Science Shop actively participates in the shaping of the different 'issues' and thus also of the publics around them, allowing for uncertainty and the changing character of that what is articulated – it *does not really need* to assume those to be connected as certain and fixed entities. It may be considered then rather a "mediator", following Latour's terminology - mediators "transform, translate, distort, and modify the meaning or the elements they are supposed to carry" (Latour, 2005:39).

Second, a mediator cannot be considered a catalyst whose own identity is not concerned by its action. For instance, when selecting requests and groups to work with, the Science Shop is concerned with choosing well, as it is its very mission that is at stake. Thus, we will be interested in the possible meaning of Latour's distinction between an intermediary and a mediator for understanding the Science Shop's practice:

> "No matter how complicated an intermediary is, it may, for all practical purposes, count for just one - or even for nothing at all because it can be easily forgotten. No matter how apparently simple a mediator may look, it may become complex; it may lead in multiple directions which will modify all the contradictory accounts attributed to its role." (Latour, 2005:39)

Consequently, we will ask how the active and involved role of the Science Shop is recognized in the process and how far it is conceived as part of the articulation effort and its democratic claim. We will equally look at the relation between the particular CBR processes and the Science Shop's structure and goals, asking how the two 'sides' of science shop work play together; or said in other words, how the dynamics of an institutionalized participatory device influence the CBR processes and vice versa.

CONCLUSIONS

In the first part of this chapter, we have seen that the DTU Science Shop's work is badly understood as transporting a democracy perspective based on the representativity of the community groups in terms of a the public interest. We have seen that although the selection criteria seem on a first glance to transport a democracy perspective close to that of strong democracy presented in chapter one, their application cannot be explained in these terms. We have seen at the same time that the DTU Science Shop's practice points to an alternative democracy perspective. This may be conceived in terms of the issue-based approach to

democracy as outlined by Marres (2005, 2007) building on Dewey's pragmatism and on actor-network theory and related STS perspectives.

The second part of the chapter has then been concerned with presenting this alternative democracy perspective and discussing its relevance for the DTU Science Shop's practice. In this sense, the Science Shop's motivation may be better understood as one of working on the *issues* brought forward by community organizations rather than as a mere support to the agenda of those groups. This fine difference means an important shift in perspective. Bringing to the center of analysis the issues, it allows to develop an understanding of how the Science Shop aims at participating in their public-ization, that is, in the articulation of publics around them and in their definition as a public affair.

This chapter has concentrated on the selection, or *qualification,* of incoming requests by the Science Shop. This analysis is completed in the next chapter with an examination of the Science Shop's facilitation of collaborative research processes initiated on the basis of accepted demands, inquiring the potential of the issue-centered perspective for understanding this part of the Science Shop's practice.

CHAPTER THREE. A COMMUNITY-BASED RESEARCH PROCESS
FACILITATED BY THE DTU SCIENCE SHOP: THE VANLØSE COLLABORATION

INTRODUCTION

In order to analyze the DTU Science Shop's facilitation of community-based research processes, this chapter follows primarily one particular process from the generation of the request to the use of its results. I will discuss the decisions taken in the different steps of the process with regard to the dimensions of issue articulation. These decisions point to the presence of an issue-centered democracy perspective in the motivation of the Science Shop at the same time as they show a conscious adaptation of this ambitious perspective to the available resources. In consequence, we will see that the perspective of issue articulation offers an interesting frame for *analyzing* the Science Shop's work on the level of particular CBR processes. We will see at the same time that it is problematic to employ the perspective for *judging* the CBR process according to its normative claim.

The case chosen for this analysis is the Vanløse collaboration that I have already described briefly in the foregoing chapter. It is a case that the Science Shop considered a particularly good example of its work. It seems to be also a very *typical* case of the Science Shop's work: it was carried out as an academic exercise done by students supervised by DTU researchers who were however not directly involved in the execution of the research, which is a usual format at the Science Shop[88]; and it was oriented towards the development of proposals, also this characteristic for a technical university's focus on engineering disciplines.

I will explore the collaborative research process by distinguishing three different moments: (1) the definition of the problem to be analyzed; (2) the analysis itself and the development of proposals; and (3) the uses of the results and the evaluations given by the participants on the project. I will give an account of these steps by offering for each first a rather descriptive part, followed by a more analytical one where I will focus on the decisions taken concerning the

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[88] The authors document this way of framing its CBR processes in their report on the Danish cases for the INTERACTS study (Brodersen and Jørgensen, 2003).

possible meaning of the collaboration as one of issue articulation. In a final section I will offer a synthesis of the considerations made and discuss the evolution of the process.

In the analytical parts, I will follow the dimensions of issue articulation suggested in the foregoing chapter: I will ask how far the process aimed at and produced an articulation of the diversity of joint and antagonistic actors and things involved in the issue, and the role given to the attachment of the research to the community group in this articulation; and I will ask for the Science Shop's involvement in the process: how far its engagement was recognized as such, and for the consequences of this engagement on the Science Shop's identity.

1. THE FIRST STEPS AND THE MEDIATING ROLE OF THE SCIENCE SHOP

On the following pages, we will follow the process from the reception of a first request made by the community group to the formalization of a demand for the Science Shop's catalogue, and the consequent definition of a first project in response to this demand. We will then see the step towards the definition of a follow-up project – the project on which I will concentrate in the following section. The leading actor in this step showed to be the Science Shop who not only brought together the different participants but participated importantly in the definition of the demand and the projects. I will conclude with the analysis of this step from the perspective of issue articulation.

1.1. *The transformation of a request into a 'demand' and a project definition*

1.1.1. The configuration of a first demand and a first project

A first step in the process was the moment in which E.H., member of the Confederation of homeowners' associations of Vanløse, became aware of the possibility of collaborating with the Science Shop. This happened thanks to J.H., the son of E.H. Being at that time a student at DTU, J.H. had been working as a student assistant in the Science Shop; at that moment he had started as a PhD student with the DTU researcher that later would become the supervisor of the collaborative projects described in this chapter. His father, E.H., knew thus of the Science Shop's existence and its way of working. But he realized that the Science Shop could be useful for his community group only when his son participated himself in such a collaboration, as he remembers:

"I saw that project, and I thought, we could use that. So I knew something [before] about what they could do out there. But it was a specific project that told me, well, you could use that. And now I wonder why I haven't seen that earlier." [I5]

So, E.H. and his community group understood that a Science Shop project could support them in their desire to contribute to urban planning in their district, which they found to be characterized by a lack of coherence and comprehensiveness. They desired to contribute to an improvement of this situation but felt in need of some preparation in order to be able to contribute significantly when offered participation by the planning authority:

"[W]e talked [with the administration] about many things happening in the districts. And the administration just said 'Well, now, we will make something here and something there'. And then they asked us 'What do you think about that?' But we were not prepared because when we said 'Well, we better like it if you did it in this or that way', they said 'Oh, we can't, because of this and that'. So we needed to be prepared. And we could see it was not enough to say 'We want to change it in another way'. We had to have an idea about what we wanted with the whole district." [I5]

The community group members decided then to propose the Science Shop a project. They were thinking about many possible aspects they were concerned by:

"[W]e had many projects that we could tell DTU about, say "Can you get this thing in the report, too?" So we have asked them if they could make a report about all those things we want. About the environment, the garbage." [I5]

In the discussions with the Science Shop, a first request crystallized. The Science Shop's archives document this request in form of a sheet with a question and a picture. The question asks: 'How to maintain Vanløse's provincial idyll?'[89] The picture shows a map of the district with the principal roads, the schools, and the green areas; it shows the new metro line together with the new metro stations to be built in the near future, and last but not least, it shows a shape in the district's center, which refers to current development activities, as for instance to the space occupied in future by the culture house then still in the planning phase. A picture of a mock-up of this culture house is shown on the right, as well as one of the district's green zones.

This first request proposed by the community group transmits thus a concrete wish of preserving the "provincial" character of the district which is related to the presence of villa

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[89] The original title in Danish: "Hvordan bevarer vi Vanløses provinsidyl".

areas as they are to be found in some of Copenhagen's districts. The reader may remember from the foregoing chapter that the residents considered the existing regulations insufficient for protecting the district's identity. The picture figuring in their request points to the relevance also of the decisions to be taken concerning the imminent development of a number of spaces in the district's center. The community group's members interpreted these developments as a challenge as well as an opportunity. So, in my interviews, one of them tried to remember the headline of their first request:

> "How to keep the provincial idyll in Vanløse, and at the same time it could be a dynamic part
> of Copenhagen, with more commerce, more stores. Wasn't it something like that?" [I7]

Another member confirmed this and concreted it in relation to the insufficient equipment of the district in terms of local commerce:

> "[W]e want it to be a quiet district, but also dynamic, you know we want more shops, so
> people are [...] shopping in the district and not going to the big centers in the neighbor
> districts. That's why we have now some of the big supermarkets, to keep people in the area
> when they are shopping." [I7]

E.H. pointed moreover to their wish to promote a feeling of belonging and social cohesion between the residents that in his view would support also a common concern about the district's development:

> "All in all, that people feel something for the area, are interested in the development of the
> district. Also in better possibilities for young people to make sports, football and whatever,
> but also a lot of arrangements, culture and so, so we could know each other better. I know
> it's maybe a little naïve, but I think if we can put people together, we have seen that, they
> can agree about some kind of development in the area." [I5]

As is usual in the Science Shop, this first request was subject to a negotiated process of adaptation in order to arrive at a demand that would be attractive for DTU students and could be included in the Science Shop's catalogue. Compared to the described initial request, the demand that appeared finally in 2001 in the catalogue is broader and more neutral (see figure 3.1). Its title is now "City planning in Vanløse", carrying thus the discipline it addresses in its name, as well as the category of the catalogue does under which it is listed ("Building and city planning"). The word "provincial", which seemed to have been of importance to the demanders as they included it in the very title of their proposal and remember this wording also years afterwards, has disappeared entirely from the text, although the demand still proposes to work on related questions such as the "modernization" of the district or the "size

of housing units", at the side of other topics. The formulation offers moreover a number of different topics that could capture the interest of the students reading the catalogue, and does not fix an immediate ideal of the future development of the district.

Urban planning in Vanløse[90]

A confederation of homeowners' associations in Vanløse would like to have carried out a series of studies concerning urban planning in Vanløse.
They would wish the following studies to be done:
- Small commerce in Vanløse and its location
- Apartment housing's environment
- Size of housing units
- Traffic in Vanløse and modification of major roads
- Modernization of the villa adjacencies and a plan for construction and renewal of the area around Vanløse station
- Renewal of Vanløse's park with sports facilities (idraetsparker), also a related study that could deal with the whole sportslive of Vanløse included the activities on Damhusengen.

Figure 3.1. The Vanløse demand in the Science Shop's catalogue 2001-02. Source: The DTU Science Shop's archives of the collaboration

This demand managed after three years of figuring in the catalogue without major changes to catch the attention of three civil engineering students. The students were interested in doing their Master's midterm or Bachelor's thesis (two students did the first and a third one the second) on the topic. A project was set up between the community group, the students and the supervisor, which I will describe only briefly. According to the resulting project definition, the students should analyze the district's situation in terms of commerce, local identity and traffic, with the goal of elaborating proposals for improving some of the detected deficits. They did so in a time frame of three months, which is typical for this kind of academic exercises at the DTU, and in close contact with the community group's members. At the end of the project, the students delivered an academic 'main report' for examination and a more practical report for the community group with a number of concrete proposals for the different aspects mentioned before (Andersen, Gawronski and Wätzold, 2004a/b). The community group showed to be satisfied with the outcome; they considered it a good inspiration and even edited a brochure with most of the students' proposals for distributing it to the district's residents (Vanløse Grundejersammenslutning, 2004). Also the students were content with the project which they considered a particularly rich learning experience.

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[90] The original title in Danish: "Byplanlægning i Vanløse"

1.1.2. The definition of a second project

Less than one year later, a second project was made up, a kind of 'follow-up' to the first one. It is this project that I will analyze in the next sections in more detail. This time, the project was set up without the intervention of the catalogue and the initiative did not come from the community group but from the students' side. I will give account of the transition from the mere expression of interest in a project in general to the definition of the project as such, in terms of the object to be studied and the theoretical and participatory approach to be adopted. We will see that a *demand* did not take formal shape in this transition, as the intermediation of the catalogue was not needed.

In early autumn 2004, two civil engineering students approached the Science Shop asking for a project about urban planning. At that moment, there was no demand figuring in the list, so that the Science Shop's research assistant promised to see if a follow-up project with some community group could be found. The students indicated the topics they would be interested to work on: urban renewal; building energy perspective; solar energy; the 'good' city as a particular approach to urban planning; renovation /refurbishment issues. They also spoke about the academic frame they envisaged, which would be that of a midterm project in their Master's degree. Finally, it was discussed who could be drawn in as a supervisor, agreeing on M.E., the same professor of the urban ecology teaching and research unit that had done the supervision for the previous project with the Vanløse community group.

The archived notes show then the traces of the exploration process undertaken by the Science Shop's research assistant for finding a community group for such a project. Different community groups were here considered; then the focus was set on the Vanløse confederation of homeowners' associations. The contact person of this group was emailed and asked if they would have some need for a second project. The response came the same day from the contact person of the community group. He had already spoken with the other two community group's members who formed part of the community group's representation in the former project. They were happy to hear of the students' interest and thought that there would be interesting possibilities, but they would have to discuss the question in the board of their confederation before giving a definite answer. He moreover gave already some indications about possible framing circumstances that would play a role, such as the positive attitude of the president of the "Lokalraad" (a sort of a local council before the invention of the local councils as described in chapter two) to such a project, or the possible interest of including into the project the Agenda 21 Center that the district was soon to have. He also

asked if the Science Shop employee could give him an indication of the Science Shop's perspective on the topics indicated.

Once the community group's members had received the okay from their community group to take part in a second project, the definition of the counterpart for the students had been achieved. Still lacking was the definition of the project's contents. This definition happened progressively during autumn and winter 2004. In a document from late autumn 2004, still some months from the beginning of the actual project, the students (whose number had increased by that moment to three) summarized the project definition as reached by that date:

- The community group proposed the students to work this time on developing proposals for the center of the district;

- As for the theoretical definition, the students would follow the paradigm of "the good city" as advanced by the Danish architect Jan Gehl (which had been on their list of interests);

- Concerning the methodology to be adopted, they would study the relevant planning strategies of Copenhagen's planning authorities, as well as the district's situation where they would apply a qualitative analysis;

- Finally, the students indicated already three different formulations of a possible project description, each of them relating slightly differently to the theory, Copenhagen's planning context and the object of the study, the center of Vanløse.

December 2nd of 2004, during a first meeting the project was formalized as a Science Shop project: it was given its archive number as a follow-up project of the first one. First organizational questions were settled and the definition of the contents was furthered. Concerning organizational matters, the start of the project was scheduled for February, when a "start-up meeting" between the students, the supervisor, the community group and the responsible staff person from the Science Shop should take place; and the students were offered a guided tour through Vanløse. This had been suggested by the community group in order to bring the students into touch with the district's reality. Concerning the contents of the project, it was discussed to focus the project this time on more concrete aspects. This happened very much between the students and the community group, whereas the supervisor saw his role in that moment primarily one of "quality control", that is to say, to judge the

reasonability of the project's design [I8]. One possible focus was seen in taking up one particular traffic proposal of current interest from the first project: how to reduce the traffic in one particularly overloaded road of the district. This was however abandoned as a topic of actuality made its entry into the discussion: the future of three vacant lots in the district center that were soon to be developed. It was these sites that it was finally decided to focus upon (as we have already seen in the foregoing chapter)[91]. One of these vacant lots was located on the site of a delocalized pharmaceutical factory that had its origins in the district and had developed into a multinational company. The others were situated on abandoned properties of the Danish railway company. Both were at that moment awaiting an uncertain future. The community group's members considered as a further relevant aspect for the project definition the lack of parking place in the district's center; and they expressed furthermore a wish for an educational institution that they thought could be placed on one of the three sites.

After this exhaustive foreplay of centering the project, it was at the formal start-up meeting at the beginning of March 2005 that the project definition was closed. Taking place at the Science Shop, it was the moment when a detailed planning was made concerning the contents, the time schedule of the project and the way the students and the community group members would collaborate[92]. During that meeting, the relevance of the focus on the two sites was underlined by two newspaper articles that the community group members had brought with them and who spoke about the sale intentions concerning one site and that another site had already been sold to an investor[93].

Resulting from the start-up meeting, a final proposal of the project's contents was drawn up:

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[91] Already in the first demand in the Science Shop's catalogue (remember figure 3.1), one possible focus of a students' project was the renewal of the district center "around Vanløse station", so that also this project definition was already contained in the first demand developed for the catalogue.

[92] See appendix A, document 2.1, for the schedule adopted.

[93] Articles from the local newspaper from 16-02-05 and 24-02-05, see appendix A, document 2.2.

"The starting point for the report will be the literature about 'the good city', how good urban space can be secured, the strategies and plans for Copenhagen's development including the life form analysis.

Together with the diagnostic study of Vanløse it will give the basis for a number of proposals for the development of the two sites [the names of the owners are indicated for reference].

As citizen participation is important in urban planning, there will be carried out afterwards qualitative interviews with selected residents in Vanløse with regard to their wishes for the district's development and to their opinions about the presented proposal.

Finally it should be possible to develop concrete proposals for the development of the two sites, considering both Copenhagen as a whole and the wishes of the residents of Vanløse."

Figure 3.2. Proposal elaborated on the basis of the decisions taken during the start-up meeting (9th march 2005). Source: The DTU Science Shop's archives of the collaboration

This proposal puts the analysis of the development potential of the three vacant lots in the district's center in the context of a particular theory - "the good city" as envisaged by the Danish architect Jan Gehl -, and aims at securing that the proposals developed would be consistent with the strategies and plans of Copenhagen's planning authorities. The proposal mentions as a "participatory" ingredient to the project that the students' preliminary proposal would be contrasted with the opinions of selected residents through interviews. The proposal does in contrast not make any explicit reference to the form that the collaboration with the community group should take.

This participatory approach deserves some further attention. The decision to include into the methodological design the interviews with the residents for getting their opinions and ideas on the students' proposals was made thanks to the initiative of the Science Shop's research assistant. She remembers that she had thought about it as a consequence of the lack of connection to the district she had observed in the proposals made in the foregoing project:

"[I]n the first [project], the solutions [the students] came up with were like [unrealistic] - even for me, [and] I am outside of Vanløse -, and I was thinking, the people in Vanløse will never accept this. Because they were just like cutting the roads, making bicycle paths all over; and maybe that's good for some people, but you have a lot of people living in Vanløse who have a car. So you can't just neglect them. So maybe I was thinking... Here we have, in the second one, we have three very central places in Vanløse, so it's quite important that people have an ownership of this, otherwise it will never work. So, I think that was my idea,

that I thought it was very important that no matter what the students came up with from the theoretical basis, they had to go out and discuss it with the people." [I4]

The project design should provide thus a better connection to the district. At the same time, it avoided in fact an explicit contribution of the community group to the elaboration of the proposals. The reason for this was according to the research assistant the need of the community group for an 'independent study', as well as the desire on the Science Shop's side of avoiding a too partial exploration:

"[T]hat [was] because of the [community group member's] position in Vanløse. So if they had not gotten a report which was [elaborated] very independently, then people in Vanløse or other politicians would say, 'This is your words, this is something you have almost bought, to say what you want it to say'. So for them it was very important. I think in other cases it's not that important. (…) But I think (…) it was also important for the students to be independent. Because [the two community group's members], they can be very persuading in what they want. So if the students had just been involved in [the two community members'] world, then they would not have learnt anything." [I4]

The end of this brief interview extract shows moreover that the Science Shop's research assistant considered its role one of *protecting* the students in the process: she wanted to guarantee the students a worthy learning experience and to protect them from being possibly overwhelmed by the community group members' enthusiasm.

To watch over this kind of aspects of a project's design is typically the Science Shop's task. The Science Shop's research assistant assumed in this project in addition the co-supervision of the students. This was due to the lack of time of their principal supervisor at that moment, so that he could not cover the particular supervision needs concerning the qualitative methods to be used. The research assistant remembers that when she suggested to include interviews in the research design, the students "looked just blank", as "[t]hey had never done that before" [I4]. She remembers that "at that point of time [their supervisor] was quite busy, so it was just like natural [to take] over that part." [I4] The Science Shop's research assistant assumed thus the task to supervise the students with regard to the qualitative research methods; as she had "no clue about urban planning"[94] [I4], the technical supervision stayed with the principal supervisor.

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[94] The report on the Danish case studies for INTERACTS concluded in this respect that a supervisor is better able to do a good supervision when its own research field is concerned (Brodersen and Jørgensen, 2003).

1.2. Analysis of the definition process from the perspective of issue articulation

We have seen in this first step the elaboration of the demand and of the project definition for starting the proper research process. Before describing and analyzing the next steps, we may already ask here how far this part of the process may be related to the concept of issue articulation as exposed in chapter one: how far it dealt with an *issue* and aimed at *articulating* it through research, rendering accountable the diversity of involved actors and things; how far the Science Shop was *openly involved* and how this involvement fed the *Science Shop's identity*. I will argue that the process aimed at working on an *issue* and at promoting an exploration of this issue beyond a mere obedience to the community group's perspective. The frame given to this exploration conditioned the degree of the exploration as a modest but well organized one, aiming at connecting to the students' academic training rather than to the realm of DTU research. The Science Shop's role was one of open and strong involvement. It was a role of a facilitator of an applied academic exercise, not related to its goal of transforming university research.

So, a first question would be whether the project aimed at working on an 'issue'. We have seen that it responded to a *claim of a mobilized group*: the community group considered that there was a lack of coherence in local urban planning and that the planning authorities would not respond to the particular challenges that the district was experiencing. We may then consider the community group as a public mobilized around an issue defined by its concerns.

We have seen that the project definition was meant to connect to this concern. Following the different translations of the initial request or expression of interest to a final definition of a concrete project, we have seen that the basic preoccupation of this step was to *maintain throughout these translations a connection to the community group's concerns*. Both variants of this process I have described –that of the generation of a demand for the catalogue that would finally catch the attention of DTU students and that of the genesis of a project bypassing the step of defining a proper demand– exemplify the difficult task of transforming a knowledge need of a community group into a demand for knowledge generation that would be of interest for the students or researchers at university. This difficulty is documented in Science Shop and CBR literature as a critical moment (Jorgensen et al., 2004; Farkas, 2002; Ospina et al, 2008), where it is warned that the original demand may be lost on the way, so that the "threat that the research will try to answer something completely different from a client's original question" (Farkas, 2002:95) may happen to come true.

Still, this interest for connecting to the community group's concerns was *not performed as a desire for cleaving to the community group's concern* (as the realist perspective of the Science Shop as an intermediary criticized in the foregoing chapter would suggest). In the process leading to the project definition, we have seen a desire of responding to the community group's concerns at the same time as for integrating the consideration of the 'wider context' of local urban planning into the project's design. The demand and finally the project definition show a more neutral (less normative) tone than the initial interest of the community group; the analysis and the development of proposals would take a broader approach, considering the municipal and regional planning strategies. We have seen thus the intention of producing an attachment with distance; at the same time, the project would not aim at working on any real articulation but rather contribute with a theoretical reflection on the subject.

At the same time, we have seen that the community group's members were concerned with assuring and justifying their representativeness: they established themselves in this first step as the spokespersons of the community group, and they sought to assure transparence in this towards the Science Shop. So also the community group's members did not interpret their role as *unproblematic* representatives of their district, their community group, or 'the social interest' in general.

We may now look at the *frame* given to the collaborative exploration of this issue. The research was defined according to the available resources:

- We have seen on the one hand that the demand has been framed according to certain academic disciplines in order to make a collaboration between the community group and university members possible. The *'disciplination'* of the issue serves at least three goals: first, it forms part of its integration into the catalogue (which shows the community groups' demands according to a number of disciplinary categories, as we have seen in chapter two). Second, it is a way of converting it into an option for an academic exercise that would fit into the students' curriculum. Third, it is a way of already orienting the exploration in terms of the methodological and theoretical approaches to be employed, so that in our case the issue would be attacked from the angle of the discipline of urban planning and a corresponding methodological approach.

- On the other hand the project was defined as *a midterm's project*: the exploration was given the typical time frame for this kind of academic exercises as well as a research design adapted to the research skills of students in their third year with little training

in the field. The projects did not form part of the supervisor's research activities. The methodological approach sought to guarantee a certain distance to the group that would both protect the students and serve the community group's interest. The research should be independent but in contact with the district, so that while the community group's participation was limited, the interviews should approach the research to the district. The rather limited time frame of three months was taken into account by designing a sufficiently small question for analysis which would be carried out according to a very detailed schedule, assuring an effective use of the time. This small portion was in some sense part of a larger exploration, as the project was something like a follow-up to an earlier project, although the design of the second project did finally not build very much on the first one.

The Science Shop showed to be actively involved in this first step and played a *leading role*. The very generation of the request was already related to the Science Shop's identity, as it relied on its network that its former student assistant, son of one of the community members, belonged to. More so, the Science Shop clearly contributed to the definition of the demand and of the project. In the case of the definition of the second project, this involvement was even clearer as the Science Shop made up the definition without disposing of a request brought forward by the community group. This contribution relied on the research assistant's knowledge and sensibility about the question of participation in general, as she did not have special expertise in the field of urban planning. The involvement of the Science Shop was formalized through the typical steps of *receiving a request-transforming it into a demand to be included in the catalogue-producing a project definition in response to this demand*, so that the Science Shop's organizational and information management structure was also involved and mobilized.

Finally, we would be interested in the meaning of this first step in the CBR process for the Science Shop's own identity. Two observations can be made here: first, the Science Shop fulfilled a role of a *facilitator that would not participate in the research but watch over it*. The project was given a clear point of departure and a clear agreement on everyone's tasks that responded to the capacities of each participant. This would make it possible for the Science Shop to watch over the fulfillment of this agreement and to protect the different participants. The Science Shop's role was thus in this first step configured to be one of bringing together different agendas for producing a kind of useful real-life learning experience and of watching over the process.

Second, we have seen that the projects were *not related to the Science Shop's important goal of influencing the DTU's research agenda.* To attribute such an aim to this particular project would be rather exaggerated and would not be subscribed by its participants who interpreted the project according to the frame it was given: we see a project that is meant to be a students' exercise working on a real-life problem in contact with a community group and hopefully useful for that community group. The project did not especially aim at fitting into the supervisor's research interests; in fact the supervisor was so busy that the Science Shop's staff needed to take over part of the supervision.

The analysis of the processes' first steps has shown that the process resonates with the perspective of issue articulation: it appeared to be driven by an interest for publics mobilized by their concerns rather than for groups representative of civil society; it had an interest for creating a research process attached to the community group's goals but not unconditionally so; and it revealed an involved role of the Science Shop. At the same time, the frame given to the process appears to be modest in the light of the ambitious goal of issue articulation. The next section will explore how the proper research carried out by the students may be interpreted in this sense.

2. 'INDEPENDENT AND PARTICIPATORY'? THE RESEARCH PROCESS

Let's take up the thread of the process where we abandoned it before. The start-up meeting at the beginning of March gave with the produced proposal of the project definition the starting shot for the students' research process. The students began now to explore what future could be envisaged for the three vacant lots in the center of Vanløse. We will follow the exploration process in the order the students offer in their final report (Frølunde, Møller and Nielsen, 2005), that is, from theory review to proposals. Afterwards, we will analyze the responses given through the process to a series of challenges, deriving from the participatory character of the process and from the frame given to it. This will allow to problematize the science shop's goal of promoting 'independent, participatory research'.

2.1. *Following the steps of student-driven research*

The report starts with a review of the different theories that showed to be relevant for the study, then passes on to a review of the municipal and regional planning strategies, and comes finally to a first step of closure through the confrontation of the theories and the strategies. The outcome of this first step is a kind of theoretical fundament, marked by a number of

aspects the students found to be relevant and consistent for their research. As a next step we find a diagnostic study of the district and especially its center, which is then contrasted with the theoretical fundament developed beforehand. This step is closed by the presentation of a preliminary proposal, based on the diagnostic study and on a critical consideration of the perspective of the community group. This preliminary proposal provides the basis for the next step which consisted in conducting five qualitative interviews with residents of the district and integrating the findings into the proposal. Here, the interviewees were first asked for their opinions and ideas about planning issues in their district; afterwards they were presented the students' preliminary proposal and invited to give their opinion on it. The interviewee's opinions are contrasted with the preliminary proposal and with the theoretical fundament. A final proposal, elaborated on the whole of the foregoing analysis, concludes the report. The report shows thus a research design with the basic structure of *theory review - access to reality - contrast both - develop a proposal*, where "reality" is split in several layers: the strategic planning of administration, the local reality, and the residents' reality. It zooms in from the most general (theories) to the most specific (proposals), from the abstract to the concrete, with a sort of reflexive loop introduced by the interviews with the residents that would evaluate the preliminary proposal.

In the following sections, I will present in more detail the above outlined contents of the report in order to discuss them afterwards.

2.1.1. Reviewing theory and Copenhagen's planning strategy

The students' theory and strategy review discusses the following set of theoretical approaches:

a) The guiding question of their study is what would make a **"good city"** and what considerations should in consequence guide urban planning in the search for that good city (p.21 ff). The students first point to the diversity of perspectives on this question as advanced by different groups concerned with urban planning such as politicians, architects, sociologists and residents, and to the heterogeneity of this last group in particular. They advance then the perspective offered by the internationally renowned Danish architect and urban planning practitioner Jan Gehl, who has played an important role in the development of Copenhagen during the last decades. Relying on Gehl (2003), they argue that the city cannot be regarded just as a physical space but that it should be designed as a space for "human activities": a good city would be one whose urban configuration would be directed to "making the individual feel comfortable" in the city,

and this would be achieved by encouraging human activity in the city. A good city should encourage its inhabitants to use the public space for more than only the "necessary activities", it should encourage "social activities". Supportive factors would be here creativity, tolerance, diversity, and attractive housing conditions.

b) Another question is how **urban functions** (such as housing, offices, commercial spaces, etc.) should be distributed spatially. They discuss here several perspectives that deal with the environmental performance of the city in relation to impacts of land use and traffic:

- As their task is one of allocating different urban functions, they discuss whether urban planning should follow a paradigm of **"functional separation"** or rather of **"functional integration"**. Following the first, urban functions should be spatially separated; following the second, the configuration of urban spaces should show a balanced mix of the different functions. Here, the students discuss the shift from the first paradigm to the second as the now generally accepted one. It is thus the idea of functional integration that they retain for their study.

- What would be more appropriate - the ideal of a "**compact city"** or of a **"diffuse city"**? They show it a relevant discussion because of the development opportunities that the free plots in the center of Vanløse bring about and where decisions have to be made: whether these spaces should be developed aiming at a dense district center or one with open spaces. They give arguments in favor of and against the compact city and conclude that "a single big city is not necessarily the most ecological solution" (p. 28). They retain thus the ambivalence between both perspectives.

- They also consider one particular planning strategy that concerns the location of economic activities in relation to transport infrastructures: the "ABC location strategy". The installation of new business activities as foreseen for the district center carries usually with it increased transportation needs. The ABC planning approach should help finding the appropriate locations for such new business activities that would minimize the environmental impacts of the associated transport needs.

c) The third main question is that of citizen participation in urban planning. The students state a growing interest in participation on the side of the institutions, in general and in Copenhagen; they discuss how participation is framed in Danish planning law; they list different motivations for seeking participation; they finally emphasize that the kind of

participatory format adopted should depend on the problem dealt with. Their review of theoretical perspectives on participation plays a role in the justification of the argument that the residents should participate in deciding over the future of the three sites in Vanløse's center, which is one of the basic assumptions of the CBR process. But it also will give throughout the report the occasion of returning critically to the question of participation.

d) Finally, they discuss the theoretical perspectives underlying Copenhagen's municipal and regional planning documents, around the there appearing concepts of 'life forms' and the 'creative class', in order to understand the planning authorities' perspective on their object of study. The concept of 'life forms' is discussed in order to be able to interpret a survey on this topic carried out for Copenhagen's planning. This survey classified Copenhagen's society in a number of different life forms, in order to obtain units of analysis for planning. The students seek thus to understand the nature of these units of analysis, that is to say, how they divide the urban reality into categories (for instance, in between the individual and the collective, or in between the social and the spatial).

The students discuss then the concept of the 'creative class' (Florida, 2002) - this concept and the way the students deal with it prove to be of special interest for our research. We learn that according to this concept the presence of a certain type of citizens (a range of academic professions / educated people as well as artists and other creative people) would be the reason for a city's economic growth (those cities "prosper") while those that do not count with these creative people stagnate. This diagnosis leads to certain recommendations for cities eager to prosper, helping them in creating the appropriate conditions for attracting such a creative class. Basically, for a city to become a magnet for the creative class, it must be an example of "the three 'T's" of Talent (have a highly talented/educated/skilled population), Tolerance (have a diverse community, which has a 'live and let live' ethos), and Technology (have the technological infrastructure necessary to fuel an entrepreneurial culture). The theory made career through Florida's book "The rise of the creative class" (2002) and his consequent work (a good number of articles), which provoked multiple applications of the theory, including that by the Copenhagen planning authorities who base part of their strategy on this perspective[95].

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[95] The students document the interests of Copenhagen's planning authorities in the creative class concept with their references nº 29 and 30 (City Council), and reference 19 (the then regional planning authority HUR).

As is typical and adequate for an academic exercise at this level of studies, the theoretical foundation relies heavily on the theoretical input as provided by the supervisor. This is visible in the fact that most of the authors that the students refer to can easily be related to the supervisor's academic network[96].

2.1.2. Adopting a theoretical position

After their theory and strategy review, the students develop a confrontation of the before discussed elements in order to develop the theoretical position from where to proceed. This position is then composed by a number of accepted principles from the discussed theories.

The students analyze both the relevance of the discussed theories for their research object and retain a number of aspects found to be relevant. For instance, concerning the 'compact – diffuse city' discussion the students retain the ambivalence between the implications of the presence of a public transport node in the district's center and the district's "green character" that should be preserved according to Copenhagen's planning documents. The first would demand to follow rather an ideal of the compact city, concentrating activities around the metro station in order to reduce transport; but the ideal of the compact city could be opposed to the preservation of the district's identity. So they are concerned with confronting the theories with the reviewed planning strategies. They discuss also the transferability of the ABC location strategy to their research question, as this theory had been successfully applied in the Dutch context but was new to Danish planning practice.

More so, they confront the theories themselves: they look at the theoretical consistence and the compatibility of the different theoretical elements. In this sense, they look at the interrelation of the different aspects or theories with each other, as is the case with the principle of functional integration which is discussed in its relationship with Gehl's theory about the "good city" (the functional integration should go hand in hand with the promotion of social relations in the development of the city and of a climate of tolerance and diversity). And highlighting Gehl's perspective in its important role as a vision or guiding principle, although being also quite idealistic, they relate it to the discussion about citizen participation for touching common issues such as the role of social relations for a good city, and the relation of residents with the city or the district in terms of feelings of identification or responsibility.

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[96] This is the case with the theories described under b) and c), where the students quote the Danish researchers Peter Hartoft-Nielsen, Annika Agger and Ole Michael Jensen.

However, the effort of seeking theoretical coherence is best seen in the discussion of the creative class, which actually occupies the biggest part of the discussion. The students show to be aware of the implications that the concept might have in relation to the other theories and particularly in relation to Gehl's "good city". Also the way how the concept is used by the regional and municipal planning authorities is recognized as relevant for the research question. They break the critique of the concept down into a discussion of its 'external value', referring to the usefulness for planning in Copenhagen and Vanløse, and of its 'internal validity', where they analyze the scientific quality of the theory. Concerning the first, they discuss the relevance of the concept for Copenhagen's planning by analyzing both a regional planning document (HUR, 2004) and the municipal planning document that was effective at that moment (Københavns Kommune, 2004). They state that the concept is used in both documents and has thus influenced both planning strategies. They explain though that it is actually being used with reservations by both planning authorities.

Concerning the internal validity of the theory, they show a rather critical stance. By contrasting it with the "good city" because of its conceptual similarities (both speak of creativity and tolerance and related ideas), they argue that Gehl's good city is more consistent. They criticize Florida's rather broad definition of the 'creative class' and the lack of a detailed exploration of basic concepts of the theory such as 'tolerance', taking for granted the kind of social relations necessary for tolerance and life quality. Apart from this lack of carefulness, the students also detected the tendency of the theory to privilege one particular sector of the population neglecting other important groups. They point out that this stands quite in contrast to Gehl's perspective that treats urban quality as a much more complex question and that emphasizes the role of the city as a place for human activity.

2.1.3. Analyzing the problem – and reducing it to a manageable complexity

With the theoretical foundation developed in the first parts of the report, the students proceed to integrating different data into their analysis and proposal development. For doing so, the students present here the diagnostic study of the district, looking at its history, its present situation and the plans for its future; as the interest of the project lies especially with the development of the center of the district and the three vacant lots, these are given special attention in this description. Again, I will give here a brief description of each aspect in order to permit the reader following the students' exploration.

Concerning the district's history, we learn that this traces back to the 15th century, when Vanløse was still a village close to the city of Copenhagen. The students follow the progressive incorporation of the settlement into the growing Copenhagen; they describe also the development of building regulations in the city that are installed from the beginning of the 20th century on and that influenced the district's developments, as well as the development of public transport that connects the district to the city. In their description of the current situation of the district, they give an architectural and urbanistic characterization, that highlights the residential character of large parts of the district and a number of especially interesting urban or architectural configurations, including those areas that may be described as 'villa areas'. They describe the situation of transport infrastructures, which is marked by the recent connection to Copenhagen's metro transport network in addition to the suburban S-train network giving direct connection to Copenhagen's airport located at the other end of the city. They describe the situation of local commerce as characterized by an absence of large commercial centers which are in contrast to be found in the neighbor districts; a circumstance that makes the district's residents do their shopping outside the district. The students give furthermore an overview of the recreational and green areas, of the cultural and leisure time activities, as well as of the district's institutions. Last but not least, they give the population statistics of the district, always in relation to Copenhagen as a whole. The data emphasizes that we are looking at one of the wealthier districts of the city: among other aspects, we learn here that the district's population has in average a higher education than Copenhagen's average; that we find a lower rate of non-Danish people; and that the average income as well as the employment rate are higher than the average.

The students introduce us then to the district's center. At the moment of the study, this area underwent important transformations due to the newly built metro station and to the installation of the culture house that would be inaugurated in the district in that year. The students describe that these transformations lacked an adequate consideration of the increasingly difficult parking situation. This was characterized by an overload of the parking capacities, being the center the district's space of small commerce and also an important traffic node due to the new metro station.

The students focus then on the three sites. They all lie close to the metro station (two of them in fact lie side by side: the "Toyota-site" and that of the Danish railway company; see figure 3.4 in the following section for a localization of the three spaces on the district's map). The students describe for each their physical conditions, the ownership and the perspectives for

their future development as outlined in the corresponding land use plans. Though, before doing so, the students advance that for the purpose of their study, *they would do as if these conditions (ownership, planning regulations and physical conditions) would not suppose a limitation to the envisaged development of proposals for these sites*: they would assume that they would have the sites to their full disposal (explicitly disregarding the complicated question of their ownership); that the valid plans could be accordingly changed (disregarding the time frames and other conditions necessary for introducing changes to such planning documents); and that there would be no need of decontaminating the sites (knowing that this could be a need for instance in the case of the site of the pharmaceutical company that showed a slight lead contamination). However, the conditions of ownership and valid plans are then described for each site. So, concerning the question of ownership, each of the spaces was owned by a different private investor (two of which I have mentioned already earlier), one right at that moment standing for sale. With regard to the valid plans existing for the sites, they found that only in one case the valid plan coincided with the unit they were supposed to look at (the Toyota-site), while the others were part of wider planning units in the municipal planning documents. The different plans prescribe a variety of uses that should be given to the sites, from "shops, businesses and parking spaces" in the case of the Toyota-site, commercial spaces and cultural activities that would strengthen the district's center in the case of the railway company; and for the third site, which had been home to the pharmaceutical company, a planning document of a wider scale determined for this and adjacent areas a "mixed residential and business" use.

With regard to the district's perspectives for the future, the students give then an account of the vision of the district's future as contained in the municipality's main planning document (Københavns Kommune, 2001) – emphasizing that the district's green and residential character was to be maintained while developing the district's center potentials as a center of commercial and cultural activity. They comment critically the incoherent planning of the parking situation in relation to these ambitious plans and cite the community group's critique of a general lack of comprehensive planning for the district.

2.1.4. Elaborating proposals with 'inspirations' from the residents and the community group

After describing the district and the three sites, the students offer a section where they contrast this diagnostic study with the theories and with aspects or concrete needs pointed to in the municipal and regional planning strategies. The conclusions drawn from this are that

- the district center may be densified without destroying the district's green character;

- the ideal of functional integration should be followed so that the city center should offer spaces of residential and commercial use, and for services and "activities";

- planning should create spaces for the "knowledge economy and creative growth environments", as this would respond to the theoretical frame given by the 'good city';

- there should be "a wide range of activities, facilities and venues" in Vanløse;

- there was a need for "flexible sports facilities" in Vanløse;

- the integration of a conference center into the plans would allow to connect the district to the development plans of the regional and municipal authorities;

- in spite of the shortage of parking spaces in Vanløse, sustainability would speak against the creation of new parking space;

- in spite of the need for more child care institutions in Copenhagen pointed to in municipality's planning, no additional child care and recreational facilities for children should be created in the district's center;

- and that an educational institution as foreseen in the regional planning for some place in Copenhagen may be created in Vanløse.

The reports shows thus how the students tried to make their proposals respond to the district's situation at the same time as to the needs and guidelines as outlined in municipal planning. From this list of dos and don'ts the students made up a list of "provisional" proposals, which resulted very similar to the list given above.

In a next step, they presented four proposals made by the community group for the three sites: an Agenda21 center (plans for such a center had been discussed but not shown successful); a health center with rehabilitation and health functions; a shopping center with an associated parking space on the site of the pharmaceutical company (in order to make the Vanløse residents do their shopping in the district); and an educational center (as for instance a local division of the Aarhus School of Business). The students provide a discussion of these different proposals and come then to establish what they call their "*preliminary proposal*": a coherent proposal that they would confront with the opinions of a number of selected residents. This preliminary proposal consisted then of four spaces that sought to respond to

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the whole of the concluded needs for the district and to one of the "wishes" expressed by the community group: a *start-up center* for creative entrepreneurs; *youth housing* that would promote the presence and permanence of young people in the district center; a *multifunctional venue* for social gathering and creativity; and a *flexible sports/activities center* containing for instance a swimming pool, a health center and a conference center, as an "attempt to meet as many of the other proposals as possible" (p.84). The students retain furthermore the need for an only limited increase of parking space.

Concerning the integration of the community group's wishes, we see that they only maintained the health center. They did not include the Agenda21 center that in their eyes could be allocated in already existing spaces; they excluded also the shopping center which they considered to be covered by other plans made in this direction; and they judged the proposal of an educational center as unrealistic.

As a next step, we find the "midway" meeting in the end of April, held as usually in the projects facilitated by the Science Shop between the whole of the participants in the project. This meeting was an official moment of reviewing the planning of the project, which resulted slightly updated. It gave moreover the opportunity for discussing jointly the selection of residents for the interviews the students were meant to conduct in their next step. Here, the community group suggested most of the candidates.

The students enquired then in five interviews with six selected residents their opinions on the future of the three vacant lots and presented afterwards their proposals to the residents in order to obtain their critiques. With only six interviewees the selection could not aim at obtaining a representative sample; the selection was thus driven by the interest of getting a wide range of perspectives by covering a number of variables such as "age, sex, marital status, income, employment and interests" (p.18). The opinions and wishes expressed by the residents were taken into account in the elaboration of the final proposal, which did however not change substantially, as "a lot of the things that [the interviewees] proposed [were] pretty much the same as the ones that [the students] got" [I10]:

-   In some aspects the students took the residents' wishes and opinions as a valid input for their reflection. The discussion of the parking situation in the district's center offers here an example. The students describe how some of the residents considered that there was a lack of parking lots for a proper development of the district centre's commercial and cultural activities. They thought that this could be solved by adding new parking lots, at the same time as they were conscious about the fact that more

parking places could attract more cars to the city center. As urban planning experts-to-be, the students tried thus to offer a preliminary evaluation on this dilemma and suggested in their final proposal a thorough investigation on the district's traffic situation.

- In other occasions, they adopted a more critical perspective towards the residents' wishes and opinions. This was the case with the "need for common meeting facilities" stated by some residents (p.105), where the students doubted whether that need could not be covered by existing equipments of the district. Also the students' inclusion of the conference center in their final proposal reflects a similar movement of taking distance to the residents' wishes and opinions, who disagreed about that point, arguing that such a conference center would not be appropriate for the district due to the traffic loads it would cause (p. 99). The students stuck nevertheless to this part of their proposal after some justification that this should be an "alternative" conference center, that is, an adapted one to the district's situation and to the resident's wishes (p. 112).

The students spoke furthermore with an employee of the delocalized pharmaceutical company owning one of the sites, presenting them their ideas and asking for his opinion – this conversation did however not seem to have further influenced the student's proposals.

The final proposal the students finally arrived at consisted "**of a multifunctional venue, a start-up center, a small shopping-center, a college and youth dormitory as well as a flexible sports/activity center**" (p. 117; see figure 3.4 for the map offered by the students):

- The multifunctional venue ("Multifunktionelt modested") corresponds to the "Toyota site" (which owes its name to its former occupation) and should be Vanløse's outdoor space for sport, leisure and social gathering that "should be attractive to all age-groups" of the district. In the concrete proposals for this space, the students were here heavily inspired by an urban planning project called *Prags Boulevard*[97] in Copenhagen's district Amager, still in the phase of conception when the students did their study and thus only virtually existing. The students did not only draw on the project's innovate way of making public space usable for leisure activities of a variety of different social groups, but also on the way the planners sought to integrate the future users into the

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[97] This example was considered as especially interesting by one of the interviewed members of the community group, as I will describe later (section 3.1.).

space in order to achieve a feeling of ownership by proposing caring functions for the residents. This way the residents would "feel connected to it and [would] want to make it a nice place." [I10]

- The start-up center ("Ivaerksaetterhus") corresponds to the building of the Danish railway company. This building should be renovated for allocating office spaces for innovate entrepreneurs; the students suggested equally dedicating part of the building to the Agenda21 center in order to allow synergies between the entrepreneurial orientation and the environmental one.

- The rest of the proposals are located on the terrain of the delocalized chemical factory: the shopping center ("Butikstorv"), the college and youth dormitory ("Kollegie- og ungdomsboliger"), and the flexible sports/activity center including a conference venue ("Fleksibelt idraets-/aktivitetshus"). In their design, the students were inspired by *DGI-byen*, a recently built center for conferences and all sorts of cultural and sports activities in the very city center of Copenhagen.
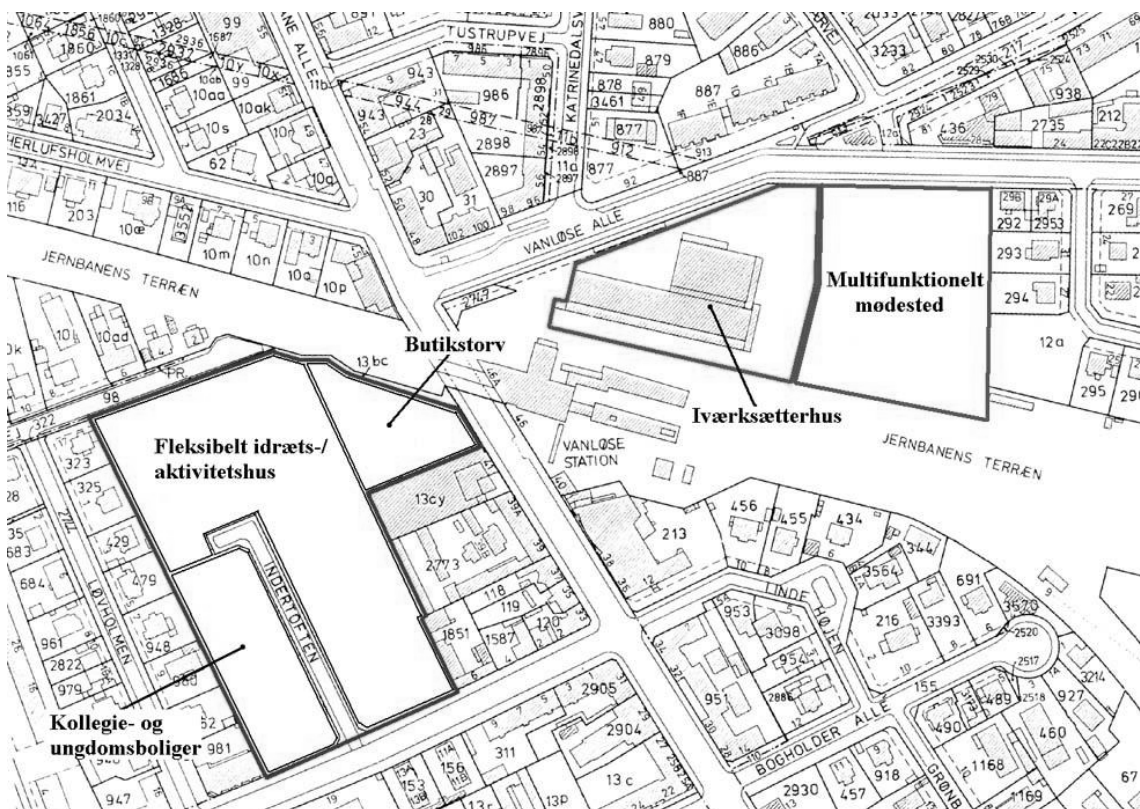
Figure 3.3. The three sites with the students' proposals. Source: Frølunde et al., 2005: 117

The students present this final proposal as the result of their exploration process of theories, strategies and their diagnostic study, and also slightly influenced by the results of the confrontation of their preliminary proposals with the residents, that they qualify as an "inspiration for a number of minor modifications". They do not make explicit in this presentation how their proposal was influenced by their contact with the community group, although we have seen that their proposal finally takes up a number of the suggestions made by its members: the health center, a space for commercial activities, and even the Agenda21 center that they had earlier considered not to include.

The students mention furthermore that the interviews served also "as inspiration for the proposals for participatory processes and the proposals for further work", offered in one of the last chapters of the report in order to envisage how to connect their proposals to the residents and the district's reality. There, the students recommend conducting a participatory process with regard to their proposals in general and in particular a broad participatory process concerning the conference venue where the resistances to the project should be discussed and a compromise should be found. The students emphasize that such participatory processes and further work on the proposals would be "a prerequisite for the proposals themselves to be successful, as they will help to ensure that no aspect is overlooked". The students suggest thus that their study could be part of a wider effort of "drafting a much-needed comprehensive planning for Vanløse and serve as inspiration for future development of the district's center" (p.121).

To summarize the given description of the research process, the following scheme (figure 3.5) represents the before described structure of the report and points to the moments of "participation" of the community group. The figure gives a picture of how the students sought to approach themselves to their object of study in a reiterative process of contrasting theory with different perspectives on the district's reality – first with that of the planning authorities, then with the data they could gather about the district and the three vacant lots, in a third move with that of the community group, and finally with those of the residents. The scheme shows the four points of 'participation' of the community group in the process, apart from a general support to the students (as for instance by taking them to the district with a guided tour, providing material on the district): the group members had obviously participated in the definition of the project and the approach to be adopted; they had suggested the focus of the study on the three vacant sites; their wishes were taken into consideration in the elaboration of the proposal; and they helped in finding the six interviewees for the students. The three

members were in general very engaged in the process, supporting the students in any matter required. One of the students recalled that she experienced their engaged attitude as a pressure; she did not consider this a fault on behalf of the community group but rather a challenge of such a project that makes the students' academic work be taken much more seriously than usual [I10].
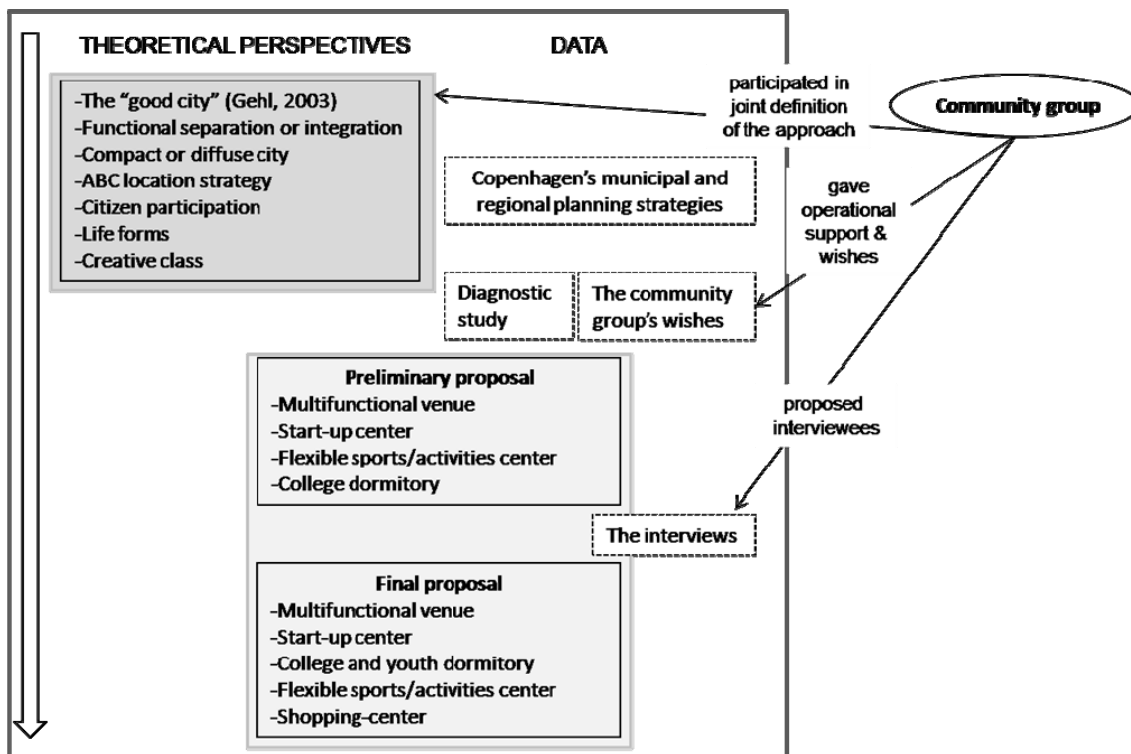
Figure 3.4. The structure of the students' report. Source: own elaboration

I have described thus by now the development of the research process by the students in response to the community group's wishes and in some contact with the group. Before discussing how the results of the process were used and evaluated, we can now step back and look at the research process from the perspective of issue articulation.

2.2. The research process from the perspective of issue articulation

We may now ask how far the research process may be understood in terms of 'issue articulation'. I will discuss that the research showed an interest in exploring the issue in its complexity and that it showed at the same time decisions to limit this exploration to a manageable size that would be adequate to the frame chosen for the project. The students, as

principal actors in this step, explored their way between 'independence' and 'participation', in order to produce a 'constructive' response to the issue's uncertainties. I will discuss the Science Shop's involvement through its role of watching over the participatory quality while delegating the technical expertise. As a consequence, the Science Shop's identity seemed to have been confirmed in its role as an 'expert' in participatory processes as well as in that of a coordinator.

So we may first look at how far the research process took into account the variety of actors and things that would be related to the question to be explored. We have seen that the students effectively approached the question from a number of different perspectives, including an exhaustive diagnostic study. We have seen also that considerable effort has been dedicated to the confrontation of the different perspectives and evidences each time a new one had been introduced: after the presentation of the planning strategies, these were confronted with the theoretical fundament; after the presentation of the diagnostic study, this was discussed with regard to theory and strategies; and so on.

We can equally observe that the scope of this exploration and confrontation was consciously limited. In accordance to the time and academic frame given to the research, the students took one explicit decision in this respect, and another less explicit decision:

- The first decision was not to take into account in the elaboration of the proposals the limitations deriving from the current conditions of the three sites described in the diagnostic study in terms of ownership, valid land use plans and the sites' physical conditions. The complex interplay between the planning apparatus, the involved economic actors and the physical reality of the sites (as for instance the lead contamination of one of them) was this way obviated. This allowed the students to work on a hypothetical question sufficiently narrow to elaborate a consistent project. At the same time, it made them ignore an important part of the demands, claims, and resistances that would intervene in their topic.

- The second decision was taken slightly later, when the students made the step from analysis to the development of their proposals. We have seen that in this step they decided to accept that the theoretical position of the 'good city', adopted as their principal theoretical fundament in the theory review, could be combined without deeper discussion with the strategic interest of municipal and regional planning in the 'creative class' concept. This decision produces thus a certain rupture in their argumentation chain that I may briefly recall: in the confrontation of the two concepts,

they had concluded that the creative class concept would stand in contrast to the theoretical and also normative position of "the good city". Although the students did not rely in their argumentation on related urban planning literature, their discussion shows to be here in line with a strand of urban planning literature that is critical with the concept of the creative class (or also the "creative city"). This literature holds that its wide application employed in urban planning practice is linked to an agenda of competition between European metropolis and to entrepreneurial government models that often run under the discourse of "urban governance" (Lund Hansen et al., 2001); these trends are questioned for their negative effects on democracy and social justice (Peck, 2005; Bayliss, 2007; García Herrera, 2007)[98]. In their confrontation *the students concluded that the use of the concept by Copenhagen's planning authorities seems to be different* (that these authorities use the concept "with reservations"). This interpretation is based on an analysis of the discourse contained in the planning documents; it appears however a rather easily made conclusion lacking a consistent proof. Their interpretation stands in contrast to more critical analyses of the application of the concept in Copenhagen (Lund Hansen et al., 2001) – which does not mean that the students would be wrong but that their conclusion would have benefitted of a more solid argumentation. In the step towards the elaboration of their proposals they clearly subscribe then to those goals of municipal and regional planning that show to be oriented by the concept (as for instance when speaking of the earlier cited need of supporting the "knowledge economy and creative business environments"). This way of dealing with the concept allowed the students to integrate their proposals into the planning perspective of Copenhagen's planning authorities and the actual trends of the city's development – they finally came to adopt a perspective that "was pretty much what the municipality had said about Copenhagen as a general area, and also [about] (…) Vanløse as a part of the city." [I10]

We find in these two decisions an interesting opposition concerning the degree of realism envisaged by the students: with the first they assume *not to be realistic* as they would not take the constraints posed by the sites themselves into account; with the second they opt for *being very realistic*, that is, taking very much into account the strategic frame given by municipal and

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[98] A review of the critiques in the field of urban planning is offered for instance by Peck, 2005. Furthermore the recent Urban Studies special issue from May 2009, "Trajectories of the New Economy: Regeneration and Dislocation in the Inner City" offers a number of pro and contra articles.

regional planning – in spite of the clear conflict between this frame and the theoretical fundament that they had chosen. In both aspects, the students elided the exploration of those difficult aspects of urban planning practice that require and justify the existence of the *discipline* with its theoretical and methodological instruments for making sense of the interplay of regulations, plans, economic and administrative actors, politicians, citizens, and physical conditions.

These two decisions demonstrate the students' attempts of being *constructive* in spite of the limited resources at their disposal – producing proposals in spite of the fact that the urban planning situation they were studying would be much more complex, both with regard to the conditions of the three sites and the framing conditions of municipal and regional planning and beyond. They also show the normative character of their research: the students had to take *decisions* in the generation of proposals for taking into account certain aspects and actors more than others, decisions that would necessarily be a reduction of the situation's complexity.

It proves then interesting to enquire the nature of this idea of constructiveness that the project transports with respect to the idea of the issue articulation, and its relation to the participatory character of the research. On a first glance to be constructive seemed to consist in producing a useful result for the community group, so that we would recognize the idea of applied research in the process; the constructive character seemed to lie nevertheless also in producing a constructive confrontation of perspectives, as would correspond to the idea of issue articulation. The process showed a *clear attachment to the action goals of the community group but not to its perspective on the issue* – as already the first step of the research design sought to assure precisely because of the action goals of the community group, as only an 'independent' study would be taken seriously.

We have seen that this research design required not confronting the proposals elaborated by the students with the community group but seeking that confrontation instead through the interviews with the residents of the district. This produced the desired friction with local perspectives on the development of the three sites but produced also a new dilemma: how far could these interviews give the desired access to the district's reality? In the report, the students avoided explicitly interpreting the opinions as being in some form representative of the district. The residents had been selected with the aim of the greatest possible *variety of experiences of the district*. Yet, when looking back on the project during our interview, one student showed to be aware of the difficulty of interpreting these opinions as an access to the

district: the opinions uttered by the interviewees were not really different from the ideas that the students had taken from municipality. This may be illustrated by what followed the above quoted remark of the student about the similarity of the interviewees' opinions to theirs. To my question whether they had been surprised by this similarity, the student answered:

> "Yes, a little bit. (…) But of course it just showed that the municipality had done a good job in investigating what they thought would be nice, or they had done a good job telling people what they needed. I don't know." [I10]

So do the residents offer a "public opinion"? Is the similarity of their opinions to the plans of municipality a sign of successful communication on the side of the latter or rather a sign of the quality of the municipality's plans? The students could not really know - neither did they reflect about this question in their report.

The way the students took distance from the community group may have been close to the idea of the *critical friend* as practiced by their supervisor's research group, that I have described in chapter one: they tried not to assume the community group's perspective but that of the issue in question, at the same time as exploring in particular the relevance of the community group's perspective. However, for considering the process a collaborative exploration of the issue, one might have expected the students' movement between distance and attachment to be accompanied by a higher degree of confrontation. The students needed to justify their decisions only on paper and the relationship with the community group was rather characterized by a sympathetic and tolerant attitude on both sides. The status of the community group members' perspectives is in fact ambiguous: on the one hand, the label of "wishes" or "opinions" shows that they are given a status subordinated to a true 'expert' knowledge; on the other hand, their perspectives have been finally taken very much into account. We have seen that the students consider their report as a *possible input for a participatory process* but their research not as a participatory process in its own right. We understand thus that the CBR process was not really conceived as a truly 'participatory' process; at the same time, it is probable that also any other process would have come short with respect to the ambitious at the same time as rather abstract ideal of 'articulation'.

Finally, when asking how far the research process corresponded to the idea of issue articulation, we would look at the role of the Science Shop in the research. This role was on the one hand to watch over the participatory quality of the process by means of the three meetings. This meant to assure that the research process would continue to respond to the community group's action goals and that there would be contact and coordination. It included

also protecting the students from a possibly too overwhelming attitude of the community group's members. On the other hand, having introduced the particular "participatory" approach through the interviews, the research assistant accompanied the students as a co-supervisor in the application of this methodology.

The Science Shop overtook thus an important role in shaping the process in its participatory character. As already pointed out in the foregoing step, to watch over the participatory character was rather separated from the supervision concerning the technical (urban planning) contents. Other cases have shown that the Science Shop's staff may intervene also in questions of the project in spite of not disposing of specialized knowledge in the corresponding research field. The carsharing collaboration described in the foregoing chapter may serve here as an example. To remind the reader, in this project the students worked with the Danish carsharing umbrella organization on the improvement of the environmental performance of its member organizations' car fleets. The students had collected data about the users of the different carsharing clubs that composed the umbrella organization at that time, data about use patterns and preferences. This data was necessary for fulfilling the established goal of elaborating recommendations to the umbrella organization. Their use showed however to be difficult, as the data was also commercially relevant and would have intervened in the competitive relationship between the two Copenhagen carsharing organizations: Københavns Delebiler and Hertz Delebiler. The solution adopted by the students (following the deliberation in the project's steering group) was to elaborate one general report that would not disclose the local data, and to provide individual reports for every organization, so that at least each organization would have access to its own data. Thanks to the intervention of the responsible person from the Science Shop (this time its coordinator), also regional reports were elaborated that allowed to go deeper into the analysis while respecting the wish of the Copenhagen car share organizations for keeping their data private. The results of the second project were thus only in part 'public-izable', due to the need of not intervening in the particular situation of competition in the Copenhagen carsharing market. The results were filtered in order to find the optimal balance between the need for privacy and for making the results public in order to support that "niche technology" (Kemp, Schot and Hoogma, 1998) facing a well established mobility system that (still) works very much without this particular mobility solution. So although the Science Shop facilitates often projects in knowledge fields where it does not dispose of relevant technical expertise, it shows to be attentive to the contents of the research process and to intervene in the process towards a 'public-ization' of the process and its results.

To conclude, the definition and performance of a 'participatory' research that would be at the same time 'independent' has shown certainly not to be a straightforward matter but rather a 'problem' for the participants, a problem that required adapted responses. Being a student-driven research, we have seen certain challenges in this that are particular to this frame (e.g., the low training of the students), and others that appear to be shared with other frames for collaborative research at university (e.g., the balance between attachment and distance).

We have thus followed by now the process until the elaboration of the report with proposals for urban planning in the district. I will turn in the next section to the use of this 'product' by the different participants.

3. ASSESSING 'IMPACTS'

We will see how in this third step, after the students had finished their study, the product of the research allowed to satisfy the different needs of the participants simultaneously: those of the community group, the students, the supervisor, and also those of the Science Shop[99]. I will discuss on the following pages the evaluations and uses of both projects - those of the first only briefly described as well as those of the second exhaustively analyzed - as they cannot be really considered separately.

3.1. Research outcomes: actors and collaborations

Some weeks before the examination date of the students, the final meeting of the project was celebrated. It was coordinated by the Science Shop's research assistant and was attended by the whole of the participants: the research assistant herself, the students, the three representatives from the community group and the supervisor. Typically this final meeting is the moment where the report is presented and handed over to the community group. The students' work is discussed by the attendees, as well as its possible uses by the community group, the possibilities of publication and eventual demands for future projects resulting from the project. In our case, the final meeting was also a "test presentation" for the students: the meeting would serve the students as a preparation for their examination, which they then passed successfully.

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[99] When considering the phase after the proper end of the collaboration, emphasis is often placed on the 'impacts' of the process (see also chapter five).

3.1.1. The students: learning about their discipline

To begin with, this and the first project showed to be "useful" for the students for passing their examination. The students appreciated them also as particularly interesting learning experiences which enriched their training at university. The projects made them acquire new perspectives on their discipline, where amongst other aspects they learnt to value the particularities of urban planning in contrast to more typical engineering methods and approaches. In this respect, one student of the first project team remembered how difficult it was to work on the question of the district's identity that was part of the first project's contents and how this challenged his previous assumptions on research:

Student: "[T]he Vanløse people, they had introduced the whole identity question, I think because it was fashionable at that point. Or it still is, right, within urban planning, and you have this really strange concept of identity, what is identity when you talk about urban planning. And they just threw it out there, so I researched for it, what that could mean and how do you handle it and... So I would say, if they hadn't come with their identity idea, or that request that we research in that, I wouldn't have touched something like "identity". But I did and...

Me: And you found it interesting then?

Student: Ya, well. The point is it was difficult to quantify, or measure, right? And that's what an engineer does. So, in general I think (…) from that project I just learned that it was okay not to have (…) a specific result for something. Just to, you know, stick your finger in it, feel it, touch it, and in some way just get something out of it that way. That's what urban planning is about, contra the whole idea of like a real engineer with buildings - that's, I think that's what I realized, that there was this difference, right? (…) So, I wasn't really proud of this project, because I was looking with like real engineer glasses on it, right? And I didn't think it was, you know, robust enough. It didn't have enough (…) real engineer stuff in it. But ya...

Me: So you changed your idea about the project? (...)

Student: Well, now when I think about it, it's a good project. And that's what I saw afterwards, what I learned about. Because I just got annoyed, when I worked with this project, that I couldn't really (…) quantify and measure that stuff which (…) was my part of the project. And I couldn't do anything about it. But I learned that [this] was a part of the engineer's job." [I9]

The projects did not only shape the students' perspective on urban planning but even shaped decisively their future professional choices, motivating some of them to specialize further in that field, to "keeping up [her] direction in urban planning", as one student explained [I10]. Furthermore, they motivated some of the students to do also their Master's thesis as a Science Shop project, and one of the students even worked after the project as a student assistant in the Science Shop.

Looking back, the students were impressed that their projects were so much used (as I will describe below), considering that they were only at the second or third year of their studies:

> "I think it was the first time that we have been taking seriously. I think that's maybe the main aspect, because we just, well we only have been studying for two or three years (…) I think it was a really strange thing to be taken seriously, and for them to use our report as much as they did. It's really amazing I think." [I10]

This same student considered that given the significance of the project to herself and its social relevance, it would be a good idea to promote this kind of projects and even integrate them structurally into the curriculum:

> "I think I got a lot out of this project. And I think it's a shame that not that many people know about the Science Shop. And not that many get the opportunity. And of course it takes a little bit more time to do a project like this than another that you just get served from your teacher, and he'd just say, 'Well, this is the project, do it like this, we have these and these guidelines.' We pretty much had to formulate our own agenda in this. Which was a big learning experience for me, and I think it's a shame that not everyone get to experience it. So I would think it would be a nice thing to get it (…) more integrated in the structure". [I10]

3.1.2. The supervisor: a contact to 'reality'

For the supervisor, the projects were part of his supervision tasks and not really connected to his research activity, as described earlier. Nevertheless, he appreciates this kind of projects for the connection to reality that they suppose for him:

> "I envy the students, because they do what I rarely get to do. Because they actually do all the interviews and so on. I rarely get to do that. So they are kind of my [access] to reality, coming back with pieces. We share experiences about like... like the students when they are doing their first interviews, 'wasn't it that wow-feeling of being there...' and really saying, well, you get new perspectives on what life is and how the world can look if you try to look through another person's eyes on what is really reality out there. So this kind of thing is really... in

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that respect you always learn something new about what is going on (...) You learn something about the specific things that you are not using that much later. But some general things can be learned still." [I8]

The supervisor showed also to stay in contact with at least some of the students. He became for not too few of them also the supervisor of their Master's thesis and was in fact very interested in engaging one of the students that he considered especially "bright" to continue with him as a PhD student[100].

The fact that the projects proved useful for the community group (as we will describe a bit further on) were a positive as well as a potentially controversial aspect for the supervisor:

The supervisor: "I am fond of (...) this kind of projects with this kind of groups (…) because (…) you really feel that … if they can use the students' work for something good, then you have contributed to a development where you can *see* this kind of local perspectives. It's not my job to develop Vanløse, but I don't mind if it develops in a positive direction.

Me: This also has to do with your idea about what university should be [like] (…)?

The supervisor: Yes... Of course, it's a contested idea somehow. But to make it short, I would say I would like the idea that I actually [was] part of moving the world a bit in the right direction. And trying to do this kind of projects and trying to open people's eyes in the right way." [I8]

So the supervisor does not consider it his "job" to intervene in Vanløse's planning situation but a nice side effect of his real task, which is that of educating the students and "making them capable of doing the real changes, when they enter the positions [where] they can make a difference" (ibidem).

3.1.3. The Science Shop's team: networking

Also the Science Shop may be called a user of the project as it became a part of its 'curriculum vitae'. And this project proved to be especially useful in this sense: about one and a half years after the project had finished, the DTU newspaper featured a sympathetic article about the project based on an interview with one of the community group's members (Plougheld, 2006; see appendix A). This article resulted from the Science Shop efforts for making itself visible on the campus, a goal usually not too easily to be achieved, as the Science Shop employee explained to me:

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[100] This has been noted in the Danish report on INTERACTS as a positive aspect of science shop work for DTU researchers under the notion of the 'recruitment aspect' (Brodersen and Jørgensen, 2003).

"[W]hat I think what has been unique in these two projects is that we from the Science Shop part have also been able to really disseminate this, compared to other projects. Because … this is something which DTU finds interesting. It's interesting for people to read in the DTU paper." [I4]

The Science Shop considered the collaboration as a successful example of its work. It uses since then the contact with the community group for showing visitors some of its projects in situ, as it did for instance in the case of some French visitors who have the intention to build up a science shop in their place and looked for some inspiration and advice.

The Science Shop's staff showed also interest in knowing more about the apparently positive outcomes of the collaboration in the district. This became visible both in the conversations that we had about the case and in the fact that the coordinator attended even one meeting of Vanløse's Local Council with me in order to get knowledgeable about the projects' relevance for the community group. He spoke however also of the Science Shop's incapacity of following each project in this sense with a proper in-depth evaluation due to a lack of resources.

3.1.4. The community group: 'inspirations' for ongoing negotiations

As for the community group, they gave a wide use to the proposals made by the students[101], employing them in the development of own ideas for the district's development and that of the three vacant lots. They also published the reports on their website and made them available in the library and as a CD that they distributed to the member organizations of Vanløse's Local Council and other interested actors. They even published a brochure on the basis of the first project that summarized its main contents in order to communicate them to the residents and to administration (Vanløse Grundejersammenslutning, 2004).

As anticipated by the students, the use of the students' reports was not a matter of applying the proposals directly; they had been developed for a kind of ideal situation leaving aside certain constraints such as the ownership of the sites or the rapidly progressing planning process. I learnt indeed that the proposals for the three vacant lots came rather late for the already quite advanced planning process. Their possible role in the complicated interaction between planners, investors, regulations and residents that would configure the future of the site was unclear. So, concerning the pharmaceutical company's site, the community group's member explained to me that here the corresponding investor had developed a proposal in

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[101] The following description is based principally on the interviews to different members of the community group, the contents of a local meeting about the district plan, and the Science Shop's archives.

coordination with the local administration, more or less during the same period during which the students were elaborating their study in spring 2005. It was before 2006 that the administration sent the Local Council the results of this coordination. When the Local Council came with proposals derived from the students' report before having received these plans, they "were told 'Sorry, but you are a bit late'". The secretiveness about these negotiations was partly linked to strategic interests of the owner of the site toward his employees, as he "couldn't tell [publicly] that he was closing the factory and build apartments [earlier] than he would tell the workers" [I6].

More so, when the Local Council wanted to have conversations with the administration about the future of the sites, they were told that not too much could be done because

> "this is a private investor. So it's not that we could demand [anything]. Except that [they] could buy part of the ground, for instance. Because, as we are telling, what we are doing now in the middle of Vanløse is what we have to see for the next hundred years maybe. So it is important that we do it right. But they don't have the money to buy it, of course." [I5]

The community group had also conversations with the private investors and made suggestions for the future development of the sites. To make the students elaborate their proposals was meant to be a basis for this,

> "[s]o we could have a talk with the private builders and say 'Would you like to realize this idea, it could be exiting'. And they have talked with us, they were willing to talk with us, but it is not much we could get them accept our ideas." [I5]

The results of the projects were thus meant to nurture the negotiations of the community group with the different actors – negotiations that had received a new and supportive frame with the administration's pilot project on the elaboration of district plans by the Local Councils described in the previous chapter. Facing the however still low influence of the Local Council's opinions compared to that of the other players in local urban planning, the community group members considered these negotiations complementary to other strategies of gaining influence on the decision making processes, notably those of mobilizing personal contacts and their partially existing power over the district's votes:

> "The dirty tricks are sometimes more effective than a letter. Because you can say, if you don't accept this, you are loosing support in our district, for instance." [I5]

Certainly thanks to this mix of strategies, the community group had effectively been able to take some of the proposals forward. The suggestion for the center for start-up companies

proposed by the students did not make it for the initially thought site but found a different location in another part of the district – which however did not satisfy everybody in that area:

"Some of the house owners are now angry, because they can't build a new garage or build in height." [I5]

The health care center will finally form part of the promotion of buildings on the site of the pharmaceutical company, as I was told by one of the members of the community group more than two years after the students' project had finished. The "place for unorganized sport", as the community group's members called the students' proposal for the multifunctional venue, was transformed by the community group into a similar but different project: they aimed at closing a street between two schools that "in the evening, and on Saturday and Sunday, could be that area we need for the unorganized sport". This is a project still under way and with uncertain outcome, as "closing the roads is extremely difficult". My interviewee was nevertheless optimistic about it, "because it is a school area, and it is a public road" [I5]. Concerning the report from the first project, it had been used in the definition process of the culture house of Vanløse which was in planning and execution at the moment of this project, as one member of the community group commented in the DTU newspaper article about the collaboration (Plougheld, 2006; [I2]).

The use of the results were not a punctual event but took time and effort. The uses still went on several years after the end of the second project, in particular in the frame of the elaboration of the district plan. Here, the different working groups of the Local Council employed for instance also the proposals from the first project about traffic and cycle routes[102].

Both the report from the project analyzed in this chapter as its predecessor showed this way to be a useful resource for the community group. The reports and the process itself made them learn new things: they helped to develop a more concrete idea of how they could participate in urban planning [I5]; and they nurtured with their data and proposals the ongoing exploration of the issue by the community group for action, for improving their participation in local planning and for promoting debate among the residents in the local process. In this sense, the community group's members describe especially the report of the second project as a source for data and for inspiration[103], they call it an "ideas catalogue" [I5] or even their "little

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[102] The working group for traffic used in this respect the proposals for biking routes in the district (Press-Kristensen, 2008).

[103] It may be worthwhile noting here that also in the collaboration about carsharing the community group framed

bible" ([I6]; Plougheld, 2006). A bible in a sense of a very worthy document, although not exaggerating its role: it is not the only source but one among others that the community group uses; and it does not serve to look up the "truth", that is, it does not offer the solutions to the urban planning problems in the district which are complex and difficult to influence [I7]. The community group seemed to have understood the project's contribution in this sense from the very beginning – they were interested in getting some good "descriptions" of their district in order to draw their own conclusions on it:

> *One member of the community group*: "When it start[ed], we want[ed] to have a description about Vanløse." (…)

> *Another member:* **"**But we have a lot of descriptions now, so we can go back and see what or how Vanløse can be described, I would say. (…) The most of the work the students have done is to describe. And then to get to make some proposals (...) [it is] interesting for us to *see* the proposals (...) it's always new." [I7]

The descriptions and proposals are thus a kind of raw material to take what they need and leave the rest – to use those examples and proposals that they like. They comment this in particular with respect to the report of the second project (pointing for instance to the example of Prags Boulevard given by the students to illustrate their proposal of the multifunctional venue):

> *Member of community group*: "[B]ecause it has a lot of contents [and] proposals. (...) To have examples. (…) It's the data collection. [He laughs]."

> *Me*: "So you can just take the reports and..."

> *Member of community group*: "...and extract what we want to use." [I7]

Another member of the community group even perceived that the project and the connection to university had contributed to changing their relationship with the planning authority:

> "I know that in the administration they have talked about that we in Vanløse have those as we call them 'alternative plans' for the city or for the area. And that's why the new secretary from the administration helping us here would talk with me, because she said 'You have some connections at the DTU' [laughs]". [I5]

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one important outcome of the projects to have received "fresh ideas", which in that collaboration also derived from the students' intensive presence at the community group's facilities and the resulting close contact with them [I14; I12].

It would be however exaggerated to interpret this as an important change in the local configuration of urban planning. The department of the municipality which promotes the mentioned pilot project in district planning with Vanløse's Local Council did for instance not have knowledge about the Science Shop collaboration and actually considered that the Local Council of Vanløse was not participating very differently in the pilot project than the local councils of the two other districts who did not count with a such a Science Shop project. This department of the municipality is however not the only one that the community group has been negotiating with in the past. The residents have to deal with different departments according to their different and distributed competences when trying to take influence on local planning - the lack of cooperation between the departments is in fact recognized as a problem by the administration who seeks to promote a better cooperation [I6]. This produces obviously also a diversity of perspectives within administration about the community group.

Finally it should be noted that the generally very positive evaluation of the students' work by the community group's members was not a unanimous perspective of the Local Council – as is to be expected within such a heterogeneous group, as we got it to know in the previous chapter. In this sense, the Local Council's chairman was rather indifferent to the project and considered it not particularly useful, as lacking a consideration of the economic changes in the district or a realistic anticipation of the municipal planning. He expressed the view that the projects had mainly benefited the students who got a very practical view of urban planning that would be helpful for them if they would want to work in this field in the future. He however admitted that the projects may have been useful for the Local Council in the sense that they learnt about how to do urban planning. This rather critical evaluation provoked in turn one of the member's involved in the project to affirm that the chairman's perspective was that of a politician (he was in fact member of the Local Council in representation of one of the local parties) and that accordingly his perspective was maybe more inclined towards the municipality's perspective.

3.2. The collaboration's outcomes in terms of issue articulation

While the project proved in general to be 'useful', we have seen that the outcomes of the research process(es) were valued in a variety of forms by its participants. It was not part of the collaboration to engage jointly in the actual articulation of the different actors concerned with the issue dealt with, which, in accordance with the initial objectives, was left to the community group. Concerning the Science Shop's involvement, we have seen that the Science Shop stayed attached to the process also after the end of the second project due to its interest in an

appropriate use of the results. More so, its coordinator considered a more in-depth evaluation interesting but exceeding the Science Shop's capacities. And finally, we have seen that the Science Shop's identity was shaped as one of a promoter of useful academic exercises, at the side of its identity of a promoter of a transformation of university research that was not touched by the collaboration. It was moreover confirmed as an entity specialized in the question of participation, and as a site of memory and information management.

We have seen that the projects were considered by the different participants as positive as they had satisfied the expectations laid on them: they proved to be useful to the community group as inspiration and as data collection; useful as a learning experience for the students and as a connection to reality for the supervisor; and useful for the Science Shop as a successful project that speaks to the people. These different uses were mutually supported by the different participants in a harmonic relationship. We see that not only the students and the Science Shop supported the community group in their use of the results but that the members of the community group and the Science Shop also supported the students in their use, as well as the community group and the students supported the Science Shop in its use. We have observed that the project participated this way in some lasting articulation of the different actors.

Concerning the issue of the district's development and in particular the three sites, we have seen that some aspects managed to stabilize, being the most salient one the health center and to a minor degree the place for unorganized sport inspired by the example of Prags Boulevard.

However, we have seen also that the community group was in fact using very much its own capacity for improvisation in order to be able to participate in some way in the configuration of the future of the three sites. It was thus left to the community group to address the issue in its complexity. The 'politics' around the issue were not touched by the process, which was in accordance to the way the process had been designed: the intervention in the decisions around the development of the district and the three sites was the task of the community group. The CBR process was this way *indirectly* related to an articulation of actors beyond the participants, as for instance of economic actors or public administration.

To judge the 'impacts' of the collaboration is then a difficult endeavor, although of interest for the Science Shop for demonstrating its (successful) performance. This "ballistic metaphor supposes the separate existence of a projectile (…) and of an environment" that receives its impact (Akrich, 2006:109) – such a clear identification of 'outcomes' and an environment that perceives them is in general a rather difficult undertaking and appears to be so also in our

case. The different 'uses' given to the collaboration's results do not correspond to a clearly defined moment of time. It is not at all clear when may we draw the line and stop to relate certain events to the collaboration – both in terms of the uses given to the proposals by the community group, and in terms of the rest of 'uses' given to the collaboration. More so, the transformation of the results is at the very heart of those uses, so that the limits between 'direct' and 'indirect' uses are blurred.

Concerning the Science Shop's involvement, although after the conclusions of the students' academic exercise the different actors went each their way, some form of attachment of the Science Shop to the project and to the use of its results continued to exist. The Science Shop stayed interested in understanding how far the general goal of a use of the results for social change was met. In this case, it did not enquire further into the subject – this in spite of the community group's obvious heterogeneity. However, other projects show that the Science Shop may engage in negotiating the use of the results of a project when it considers that they are not made sufficiently 'public'[104]. The Science Shop's scarce resources are thus mobilized in those cases that show to be conflictive, which was certainly not the case in the Vanløse collaboration.

With regard to the way how the collaboration nurtured the Science Shop's identity, three observations can be made. First, the Science Shop deemed the collaboration to be an especially successful project and uses it for demonstration purposes. This indicates that the Science Shop considered its goals addressed by the project. However, we have seen that the project was limited in its 'critical' character as the depth of the exploration had been deliberately delimited; more so, its goal of influencing the DTU's research agenda was not affected by the project – thus the Science Shop assumes that a research project does not necessarily need to connect entirely to the whole of its goals in order to be qualified as a successful experience. With this, the Science Shop appears to be a space where a diversity of goals is pursued which get only sometimes connected: the goal of producing positive socio-technical change, the goal of transforming university research and the goal of transforming university education.

Second, the projects were not supposed to perform or increase the Science Shop's possible expertise in urban planning. The Science Shop delegated the technical expertise, as it often does. This way, the Science Shop specializes in the question of participation as particular field

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[104] The concern for uses of a project's results and the conflictive potential of this phase has been reported also for science shops in general (Leydesdorff and Ward, 2005; Farkas, 2002).

of expertise – an expertise that it offers to the specific disciplines of DTU but that is meant to exist detached from any particular technical expertise.

Third, the specific technical contents dealt with in the research passed on to the Science Shop in the form of grey literature: the reports were as usual integrated into the Science Shop's archive, that is to say, they came to form part of a passive memory of the Science Shop. The management of this memory adds to the task of the process management as a facet of the Science Shop's identity.

Concluding the revision of the research process from its very definition to the uses of its results, I will dedicate the next section to integrating the different points made about it from the perspective of issue articulation.

4. THE EVOLUTION OF THE RESEARCH PROCESS FROM THE PERSPECTIVE OF ISSUE ARTICULATION

In order to develop an overall picture of the process and its evolution, it proves useful to integrate the analyses offered throughout the chapter in a synthetic regard. Table 3.1 summarizes the observations made on each step according to the two dimensions that guided the analysis: one column gathers the observations concerning the research approach and the quality of the attachment to the community group; a second column those aspects concerned with the Science Shop's identity, where I have analyzed its involvement in the process and the feedback of this involvement on its identity.

	Research methods and the attachment of the research to the community group	The Science Shop's identity: involvement and feedback
Step 1 – DEFINITION OF DEMAND / PROJECT	Local urban planning in Vanløse as an 'issue', the community group a 'concerned' public; A request is turned into a demand and project definitions: connecting the concerns of the community group while defining them; Translation into a modest but well organized frame: - 'disciplination'; - a students' mid-term project.	The Science Shop actively and openly involved as a main actor in this step: - developing from the Science Shop's 'network'; - organizational and information management; The Science Shop is configured as - an expert in participation; - a facilitator of an applied academic exercise; no connection to the goal of transforming university research.
Step 2 – RESEARCH PROCESS	Exploration of variety of actors; Modest depth according to modest frame; A situated definition of 'independent, participatory' research, with a low confrontational level; Difficulty of deciding over the representativeness of spokespersons.	The Science Shop delegates partially so that it steps rather into the background, reducing its intervention to: - coordination and 'protecting' the needs of the different participants; - watching over the participatory quality, and over the 'public' potential of the research; - slightly involved in technical supervision.
Step 3 – EVALUATION AND USES	The collaboration proved in general to be 'useful', the relationship without conflict but characterized by mutual support; The research did not engage in the actual task of articulating the different actors concerned with the issue. This was in accordance with its objectives. 'Impacts': the difficulty of accounting for distributed and long-term outcomes.	Continued attachment to the process due to the interest in an appropriate use of the results, but limited due to limited resources; The Science Shop a promoter of useful academic exercises – an identity that coexists with its identity of a promoter of a transformation of university research; An entity specialized in the question of participation; A site of memory and information management.

Table 3.1. Synthesis of the observations on each step of the Vanløse CBR process from the perspective of issue articulation.

It may be then interesting to take a look at the *evolution* of the two dimensions of issue articulation during the process. In terms of the attachment of the research to the community group's goals, we have seen that the process showed an interest for an exploration that would go beyond a mere applied research. At the same time, the frame given to the process in its first steps was rather modest. Correspondingly modest were then also the pretensions during the process and afterwards.

The research was deliberately limited and appears to be very much an exercise for *learning* about issue articulation. The students reported various aspects that can be interpreted in this sense: when speaking about the way they developed their proposals and tried thus to be constructive with regard to the issue studied, the students' commentaries show that they were confronted with their normative engagement as researchers that implies situated movements of attachment and distance; their account shows that they had to deal with the difficult question of understanding the representativeness of their evidences; one student spoke about his learning on the relevance of methodological choices in research. At the same time, this learning was not made a topic as such[105].

Also the members of the community group considered the process as a learning process about how to participate in local urban planning. We have seen that the students' proposals supported their negotiation efforts with the administration and economic actors. Although the task of articulating the students' proposals with the 'real world' was this way certainly left to the community group, it appears difficult to determine how far the CBR process participated in this 'articulation'. It appears to be complicated to draw the line between a 'learning about articulation' and a 'real articulation', and thus to determine the collaborations 'impacts'.

Concerning the relationship with the association, the research was initially meant to be attached to the community group's goals at the same time as distant to the group's views on the issue. This research design responded to practical reasons such the protection of the students and the need for an 'independent' study on the side of the community group. As a consequence, we have seen a reduced level of participation in the proper research process, understanding participation as the confrontation of claims. The process showed thus a conflict between the *independent* and the *participatory* character of the research – choosing the first, the latter had to be restricted. The slogan used by the Living Knowledge network to describe a science shop as an entity that promotes "independent, participatory research" shows to be a

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[105] At some science shops the learning experience is promoted as a reflexive exercise, for instance through requesting a reflexive report from the students after the process (Hall and Hall, 2007).

problem; a problem that has been tackled in a situated manner. Promoting situated responses to this problem, the process and thus the Science Shop engage in the (re)definition of the role of academic work in society, beyond the apparent contradiction between an independent and a participatory character of such work. This is an interesting but delicate undertaking in the eyes of some of the participants[106].

The Science Shop's involvement in the process was more important in the setting up of the CBR process and less in the rest of the process. In the beginning the Science Shop was clearly and explicitly participating in the shaping of the demand and the project definition and had in fact the leading role. The proper research process relied then mainly on the students as the principal actors, while the Science Shop's role was rather technical but still engaged, watching over the participatory quality of the collaboration. The Science Shop watched also over the 'public' character of the process in a modest way, according to the resources available and also according to the understanding of the issue its staff was able to develop without being expert in the research field. The use of the research outcomes was then characterized by variety, being the community group however here the leading actor in making the students' proposals relevant for the development of their district. Hence, the analyzed research project shows three different phases that appear to separate mediation, research and action into different tasks fulfilled by different participants of the process.

Consequently, the Science Shop's identity is configured throughout the process in a variety of forms. At moments, its role was that of a coordinator and facilitator. It was also an expert in participation that delegated the technical expertise. At the same time, it was involved in the supervision. It was engaged in guaranteeing a 'public dimension' of the research. It was configured moreover through this particular process as a promoter of useful academic exercises – an identity that coexisted with its identity of a promoter of a transformation of university research. Lastly, it was an (inter)mediating *organization* with the corresponding concern for the management of its memory, of the information flows and of the coordination activities.

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[106] The supervisor of the here described collaboration showed to be concerned about this question, as well as a member of the community group participating in the carsharing collaboration described in chapter two. She showed hesitations when asked whether projects such as hers should be generalized at the university and referred to the need of preserving the independence of university research.

CONCLUSIONS

The analysis of the Vanløse collaboration given in this chapter allows a number of conclusions on the application of the perspective of issue articulation to the Science Shop's CBR. On the one hand, the perspective seems to have a bigger potential for understanding the Science Shop's work than the strong democracy perspective outlined earlier: the Science Shop appears certainly not to be a passive intermediary in the process but an engaged and active mediator; and the attachment of the process is not meant to blindly obey the community group's expressed needs. Hence, the chapter confirms the *analytical* value of the perspective of issue articulation for studying the DTU Science Shop's work: what had been shown in the previous chapter for the qualification work of the DTU Science Shop applies also to the level of a particular CBR process.

On the other hand, it appears difficult to judge the research process in terms of issue articulation. In order to judge the process, we would need to have a clear idea about what would be a 'true' issue articulation – yet such a clear idea is not at hand. There are no correct responses to the different challenges encountered in the process (although we might have an idea how it would have worked *better*, which however cannot be but hypothetical). We might rather conceive of the Science Shop's effort as an exploration of what the rather abstract idea of issue articulation may mean in its particular situation and in the particular frame chosen.

The question for the value of the perspective of issue articulation for the *evaluation* of science shop work will be the guiding theme of the next chapter. There, I will discuss a CBR process that aimed at engaging in the articulation with the 'real world'. It is at the same time a process where I have been involved in person, so that I will be able to conduct an assessment of the process from 'within'.

CHAPTER FOUR. A REFLEXIVE ANALYSIS OF A FIRST-HAND EXPERIENCE IN

COMMUNITY-BASED RESEARCH: THE TALLER DE BARRIS

INTRODUCTION

"It's easy to see all that now, when everything has finished. When you're in the process, you don't stop and look at things from the outside. … Maybe from within it was not that easy." [I18]

Looking back, looking from the outside, or looking from within – different ways of evaluating an experience produce different conclusions. In the foregoing chapter, we have seen a CBR process 'from the outside' and 'looking back'. In contrast, this chapter offers an analysis of a CBR process also 'from within': it offers a *reflexive analysis* of an experience of participatory urban planning where the author of this thesis has participated actively; this analysis relies, again, on the perspective of issue articulation. The chapter contributes in two ways to the argument developed in the foregoing chapters: first, it allows to further develop the *understanding* of science shop work in terms of the adopted theoretical perspective; and second, it takes further the reflection on what this perspective can be for the *evaluation* of science shop work. Looking back but also looking from within, we will follow the different steps of the process in its decisions as well as in the uncertainties these decisions involved. We will see, that, in fact, "from within it was not that easy".

The *Taller de Barris* (TB) was a partly academic, partly activist research process on urban planning in the district Velluters in the city center of Valencia. It was meant to be a pilot project for a science shop at the Universidad Politécnica de Valencia (UPV). It consisted of a collaboration between students of the Universidad Politécnica de Valencia and of the University of Alicante, members of the district's neighborhood association El Palleter, and other persons interested in the goals of the project. The project was initially conceived as a participatory development of solutions for the improvement of the district's energy balance: it aimed at elaborating solutions and at generating simultaneously a social mobilization around the generated solutions; more so, it wanted to produce a 'critical learning' about the energy problem and its solutions among the different actors. The process adopted then a rather

exploratory character, prioritizing a thorough diagnostic study of the district and its problems before engaging in the development of proposals. This led to the elaboration of maps and other materials that visualized and interpreted a broad range of data in order to identify and deal with the district's problems. Two workshops produced interaction with members of the neighborhood association and other residents. The project resulted in the development of preliminary proposals for one particular space in the district and the initiation of a participatory dynamic around them. With this, the project came to its end after almost two years of work in and on the district. At that time, the outcomes of the process were more modest than initially envisaged, with respect to both the generation of solutions and the participatory dynamic to be produced. It was nevertheless considered an interesting learning experience by the people involved and was taken further by some of its participants and other groups in a number of ways.

This case offers a rich opportunity for an analysis from the perspective of issue articulation, for three reasons. First, the initially envisaged goals of the project recall *the democratic argument* contained in this perspective that we have discussed in previous chapters. It aimed at articulating a *diversity of actors* around the energy problem in a way that is both constructive and reflexive: the generation of local proposals for solving the problem should go hand in hand with a 'critical learning' about its complexity. We will see what happened to these goals when putting them into practice.

Second, the TB's process showed an *exploratory and open* way of tackling questions of participatory urban planning. It offers this way a rich contrast to the CBR process described in the foregoing chapter that was rather marked by a clear time frame and clearly delimitated goals which were attained without deviation.

Third, having *participated personally* in the process definition and coordination gives me the opportunity to provide a *reflexive* regard on the practice of issue articulation. Instead of looking from the outside on a *case* in order to see how far it corresponded or not to the theoretical perspective of issue articulation, I can look here at a process also from *the inside*: my analysis of the TB's process relies partly on the materials elaborated during the process, partly on the exhaustive email exchange between the members, partly on personal notes taken during the process – and certainly on the personal experience that has shaped my understanding of the process. This permits a privileged access to the complexity of the process. It allows to develop a picture not only of the decisions taken during the process (as done in the foregoing chapter) but also of the uncertainties involved in these decisions. But,

my personal involvement in the process entails at the same time difficulties for describing and analyzing it. The emotional attachment challenges the principles of the analytical regard, of a 'distanced view'.

My personal attachment to the process can be assumed hence as a challenge and as an opportunity: the challenge to adopt an appropriate balance between a distanced perspective and a reflexive one; the opportunity to have a richer access to the process. The structure chosen for the chapter alternates descriptive parts characterized by a rather distant regard and parts where I look back at the process from my current theoretical perspective (that of issue articulation). In a last section, I will discuss my own position towards the process and the evolution of this position. This reflexive part will shape the conclusive synthesis of the theoretical analyses made throughout the chapter, drawing special attention on the uncertainties appearing in the process in relation to my theoretical interpretation. I will conclude about the value of the perspective of issue articulation for understanding science shop work when evaluated from within.

1. THE BEGINNINGS: BRINGING TOGETHER DIFFERENT TRAJECTORIES IN A 'PILOT PROJECT'

1.1. The constitution of the project

Tracking back the various trajectories that came to constitute the Taller de Barris, one initial thread was associated to my interest in producing a first experience of collaboration between my university (the Universidad Politécnica de Valencia, UPV) and some community group. I understood this as a project of counteracting an asymmetry in the UPV's research and development activities: these appeared to be increasingly oriented towards the interests of industry and companies. I thought they were lacking an orientation towards non-profit groups and their concerns. This project dated back to 2004: having recently finished my training in environmental engineering, during which I had developed a particular interest in participatory approaches, I then started to discuss with a number of people linked to the UPV the possibilities of establishing some kind of institution that would promote collaborations between members of the UPV and non-profit groups. In these collaborations, the complementarity of the different university missions of teaching, research and outreach should be exploited – an idea that closely resembles the science shop concept, which I,

however, did not know by that date. According to the first outlines of that institution's objectives and activities, its work should be oriented to the field of renewable energies.

Amongst others, I had been discussing my idea with J.A., who was during that time finishing his studies in industrial engineering and working full time in his own company. Although working in a different field, J.A. was especially interested in bioclimatic architecture, which was also the field of his final year project. Moreover, he had experience in making up and carrying out processes aiming at socio-technical change, being a member of a university-based NGO in the sector of development aid specialized in technology and engineering projects in Latin America. He got interested in my idea, so that a possible second thread was added to mine. In our conversations about how such collaborations may support a positive technological development in the field of renewable energies, he emphasized that if we ever wanted to produce such a university-community group collaboration, we should also integrate private companies. Our discussions were at that moment however still very speculative.

S.A. was to contribute the third thread. Being resident of the district Velluters in the historic center of Valencia, he had started some years ago participating in one neighborhood association of his district called El Palleter. With the time, he had taken on an important role in the mobilization of the association around the district's problems. S.A. attended the workshop I had organized in November 2005 about the possibilities of establishing a science shop-like institution at the UPV (I had come to know the science shop concept by that time), where I had invited professors and students from the university as well as persons that could contribute with a community group's perspective. One result of this workshop was the wish of establishing a pilot project, following thereby the advice given in the SCIPAS reports nº 1 and 2 (Gnaiger and Martin, 2001; Mulder et al., 2001). This way we would explore the concept, as well as already create a real experience that should help convincing decision makers to support our initiative. The idea came up to do such a pilot project about the situation of the district Velluters and in collaboration with El Palleter. This idea was put into shape during the following months: the core of the project was created.

As our project would respond to the situation of the district Velluters and be linked to the neighborhood association, I shall briefly present both. The district, until the 19th century an important part of the city for housing its silk industry[107], pertained by 2006 to the rather degraded part of the historic downtown of Valencia. It suffered at that time a lasting process

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[107] This gave the district its name, as 'Velluters' means literally silk artisans.

of restructuration. Among its consequently considerable history of planning interventions, the most recent one had been the participation of Valencia's City Council and the regional government in the *European URBAN programme* from 1994 to 1999, a programme that aimed at the integral rehabilitation of urban districts in crisis (Jiménez Alcañiz, 2000). It built on the 1992 started "Regeneration Project of Valencia", carried out through the partly municipal, partly regional *RIVA-Ciutat Vella* office, but concentrated on the district Velluters (Habitat, 1998). Aiming at a comprehensive approach to the regeneration of the district, the initiative proposed an articulated intervention making up for the lack of public spaces, public services and affordable housing. However, the subsequent actions of eviction, demolition, and construction of public services and (social) housing (which were in the phase of execution in 2006) produced unsatisfactory outcomes. An evaluation report of the intervention produced by TUR, an urban planning research group at the UPV, documents that the intervention did not improve the problematic situation of the district but that, in fact, it reinforced it in a number of aspects (Alonso, Blasco, Martínez, Aguilar, Deltoro, and Alonso, 2005). According to the report, this problematic situation was characterized by:

- An isolation from the city although forming part of the city center;

- An internal division north-south;

- A traffic situation characterized by a "logic of the car driver" instead of a "logic of the pedestrian", including the overload by crossing traffic and the excessive use of public space for parking;

- A progressive loss of its historical identity, reinforced by the emphasis on the substitution of the existing building park over its rehabilitation, and by the disrespect of the district's architectural styles in new construction;

- A progressive displacement of its population in disadvantageous conditions, which was especially critical for the elder, its most vulnerable part; the new housing created lacked the appropriate funding schemes for the young and the economically weak population;

- A low number of residents, a high average age and a weak social life;

- An increasing property speculation on the numerous vacant lots resulting from recent and not so recent demolition activity;

- The enduring character of a large number of those vacant lots, which contributed to the proliferation of focal points of delinquency and prostitution;

- A lack of coordination between the different (public and private) actors intervening in the configuration of the district.

As for the association, it was one of two neighborhood associations in the district. It had experienced only recently a rise in activity and membership, which consisted by 2006 of approximately 100 passive and ten to twelve active members. This increase has been attributed by one of its members to the campaign with which the association had celebrated in 2004 its 25th anniversary with the campaign "Acercar al ciudadano a su espacio" (Approach the citizen to his space) (Vera, 2006). This campaign had augmented the awareness for the district in the local media and had also awaken the interest of some parts of the Valencia's universities that started to collaborate with the association in seminars, debates or the organization of expositions in the district. The increase in membership contributed moreover to the "rejuvenation" of the association's board and a renewal of 'ways of doing' within the association (ibidem).

In this sense, in the years before the TB started, the association had developed a number of mobilizations concerning some of the above mentioned problems of the district. In 2004, the conversion of a vacant lot in the district to urban agriculture served as a claim for green spaces and a critique of property speculation activities. A more recent initiative was that of the free distribution of banners with slogans praising the district's qualities that the residents could affix to their balconies. The slogans were "Velluters is history", "Velluters is moving", "Come to live in Velluters", or just "Velluters is…" leaving free space for the residents to deploy their own creativity. The association was also participating in the discussion about the commercial strategy to adopt for the district, developed by the administration and the local federation of the hospitality industry, where they advocated for promoting the installation of small and alternative commerce and argued against the extension of the nightlife-oriented hospitality industry dominating the adjacent district El Carmen. Moreover, the association was involved in mobilizations claiming for a better handling of the difficult parking situation in the district and for solutions to the problem of prostitution that a particular part of the district was suffering. Concerning the parking situation, the residents were claiming the right of being privileged in

the allocation of new parking lots in the district and were denouncing the delays in opening an underground parking built and finished already three years ago[108].

After this brief description of the very beginnings of the process, we can start to look back and discuss the TB's first steps from the perspective of issue articulation.

1.2. *The Taller de Barris as a pilot project: combining two issues?*

Looking at the beginnings of the project from the perspective of issue articulation, we may ask whether the process aimed at dealing with an *issue*, at an *articulation* of that issue, and what kind of identity the TB was given in that first moments of the process.

Concerning the question whether we are confronted here with an issue in the sense outlined in chapter two, we see that the process was created to respond to two goals that were considered problematic: on the one hand, it was meant to work on the asymmetry in the UPV's research and development activities; on the other hand, it should work on the district Velluters, a district with a problematic situation in a number of aspects.

The first was a *potential* issue, an issue-to-be: the pilot project should mobilize people around it. The second was rather broad but could qualify as an issue in its own right, showing a considerable mobilization for a better settlement of the district's problems, as we have seen before.

By defining the pilot project as a collaboration with the neighborhood association and by focusing on the district Velluters, it was the second issue that became the main issue to be dealt with, as it was the one that interested all the different actors. The interest in working on the first was not shared by the association: the association did not engage in the project because it was concerned with transforming university research, but because of the possible relevance of the project for the district.

Concerning the dimension of articulation, we see that the process should bring together different actors related either to the UPV or to the mobilization in the district, and potentially also actors from the sector of renewable energies. The TB's identity was being constituted by different trajectories that came together in a concrete project and responded this way to a diversity of interests. These trajectories were linked together through the particular logic established in the meeting about a science shop at the UPV, which was the logic of a *pilot*

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[108] The parking's opening - more than six years after it had been constructed - had been recently announced in a newspaper article (García, 2009), but this announcement has still not been translated into action.

project: a logic of exploring the feasibility and the interest of CBR activities at the UPV, of learning about it, and of demonstrating it.

Thus, the first steps show a number of potentials. We will see in the next section how these potentials came into being as the group established its goals and started working.

2. PHASE 1

The establishment of the initial objectives of the group happened progressively over the first few months. In the beginning, it was mostly the engineers J.A. and myself who made up the possible definition of the project. This resulted in a rather technology-oriented draft, aiming at developing solutions for energy saving and renewable energies in the district[109]. Being conscious that we would need to connect such solutions to the district's reality and its people, we started however with a broad diagnostic work that included a participatory event. Concerning the group dynamic, the group was in its very beginnings joined by one more student and two other students were working in parallel with the project.

2.1. *Establishing objectives and a working routine, exploring the district*

2.1.1. The first draft of the project definition

The first draft carried as preliminary title "The energetic improvement of the district Velluters". Drawn up by me and J.A., it included some modifications suggested by S.A. It had been also discussed with A.B., a member of my research group interested in and working on participatory processes who would later become an additional supervisor of my PhD. The engagement of the different team members was by that time conceived as a voluntary one in the case of J.A. and S.A. In my case, the process was meant to possibly correspond to my PhD research, that should have dealt with forms of producing participatory action research in relation to technology development and transfer. I was at that time still in search for the theoretical focus and the field work for this research. This was the reason for conceiving my involvement in the process as a *possible* part of my PhD research – depending on whether the project's development and that of my own PhD research would finally match. As for the resources that we envisaged using, S.A. had proposed to search for funding. He suggested to react on a call issued by a local bank with respect to climate issues. However, this did not translate into any concrete actions: I personally felt on the one hand somehow overwhelmed

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[109] See appendix B, document 2.1 ("First draft of the project").

by the task and slightly uncomfortable with the idea. This choice meant that all the work would be carried out in the member's free time (except, maybe, for my own involvement as the coordinator).

Concerning the draft's contents, the project was supposed to contribute to three different goals: first, the *sensibilization* of the population about the energy problem and the *diffusion* of technological and non-technological solutions that would contribute to the improvement of the quality of life of the residents, to energy saving and to the promotion of renewable energy technologies; second, the elaboration of *concrete proposals* in this sense, that should serve for claiming support from the city council as well as for being implemented by residents as pilot projects; and third, to generate processes of *"critical learning"* in the participants of the project[110]. These three goals should be achieved by a methodological approach that would rely, "with respect to the technical discipline", on the approach of *bioclimatic architecture* and, "with regard to the research process", on the methodology of *participatory action research (PAR)*. J.A. counted with some expertise concerning the approach of bioclimatic architecture, and I had some notions about it; participatory research was rather new to all of us. The initial time frame we had in mind at that moment was to have the process concluded after two years.

The draft was then already quite concrete in the definition of the technical approach, which was outlined as a process of four steps:

- (1) the gathering of quantitative and qualitative data: quantitative data would be gathered about the district's cartography, energy consumption, recent structural changes, a diagnostic study of illumination levels, land use plans, transport infrastructures, and statistics about housing, population, etc.; qualitative data would be gathered about the residents' practical experience about the problems, about recent relevant changes in their living environment and for the "quantification of the local needs"

- (2) the data analysis

- (3) the development of proposals and their implementation, and

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[110] The notion of critical learning was not further explained in the document. In a document elaborated this same year (Schlierf, Boni and Lozano, 2006) I related it to the "second-order learning" as suggested for constructive technology assessment (Schot, 2001) – a learning about the complexity involved in the search for technological solutions for environmental and social problems.

- (4) a final evaluation.

The participatory methodology would consist in integrating the residents in each of these steps, so that the research process would become a "coordinated effort between the residents of the district and the university team, which in turn [would] be composed of students and academic professionals" (see figure 4.1 for the planned participation of each group in the process). In this sense, in step 1 the residents would contribute to the gathering of data that could be relevant for assessing the energy performance of the buildings. In step 2 they could participate in the phase of data analysis with the "guidance" of a "coordinator" that would supervise the technical quality of the analysis. In step 3, they would evaluate the proposals generated by the university team, and determine together with the university team the implementation and diffusion of the proposals. Here, the process would rely when possible on channels of "peer to peer" diffusion, for instance from residents to residents or from one pupil of a school of the district to another (an aspect introduced by S.A., who contributed his non-engineer perspective). Finally, the residents would participate in step 4, the evaluation, that would include a workshop for discussing the outcomes between the different participants and that would lead to a final report with concrete proposals concluding the project. This final report should be one of the project's deliverables, as well as the diffusion of the proposals and the learning processes induced through the project.

Activity	Students	Researchers	Residents
1- Data collection	XX	X	XX
2 – Data analysis	XX	XX	?
3 - Elaboration of proposals and implementation of demonstration projects	XX	X	XX
4 – Evaluation and reports	X	XX	X

Figure 4.1. The design of the participation of the different actors in the process as indicated in the document "The energetic improvement of the Velluters district "[111].

Moreover, the draft shows that we were considering the possibility of participating in a European call dedicated to science shop projects[112], in the case we could find partners in other countries and would be able to make up a reasonable project together. In spite of some

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[111] See appendix B, document 2.1.

[112] The same European call mentioned in chapter one: FP6-2005-Science-and-society-20.

positive response from science shops in Portugal and Italy, no such international collaboration was fleshed out.

2.1.2. The first steps of the Taller de Barris

This draft was then the starting point for the process. We began meeting regularly twice a month from April 2006 on, in order to concretize the draft definition and initiate the project. We started to get knowledgeable about methodological principles of participatory action research (PAR) and initiated our diagnostic study of the district.

Our meetings took place in the premises of the neighborhood association. The group had grown by that date already to four members, as D.P. joined in as a student of architecture of the University of Alicante who was on exchange at the UPV during his last year of studies before starting his final project. He had read our draft and had liked the idea of participating in a project that would combine a technological and a social approach [I19]. The Taller de Barris consisted thus at that moment of one member of the neighborhood association, two UPV students and one member external to the association and to the UPV.

Our introduction into the PAR methodology was based on literature I had received from PAR-experienced contacts (Rodríguez-Villasante, 1993, 1994; Encina, Rosa and Caraballo, 2005). These contacts had also inspired our final name, Taller de Barris, which is the translation into the local language of the name that the Sevilla-based science shop Arquitectura y Compromiso Social gave to some of its CBR processes. Our actual approach did however not meet entirely one principle that is usually emphasized in PAR literature (e.g., Colectivo IOE, 1993): PAR processes should depart from the concerns of a community group (it should respond to a demand), and it is these concerns that should stand in the center of the process. In contrast, we had started with an agenda that was markedly our own, consisting in the wish of working on aspects related to bioclimatic architecture. We did not want to work on just anything that the neighborhood association would ask us for but on something that would make also sense for us. At the same time, we were conscious about the need to connect to the concerns of the district's residents if we wanted to achieve any kind of participatory process. We decided however to follow the widely held PAR principle holding that the research should be done in a circle of planning-action-reflection in order to produce a periodical readjustment of the objectives and planning (Lewin, 1946; Zuber-Skerritt, 2001). Another suggestion made by members of Arquitectura y Compromiso Social was to integrate artists into our project. They considered that an artistic approach could be helpful if not necessary for working in a

participatory way on urban planning as we imagined doing it. We started thus with some inspiration from PAR and a process of exploration ahead.

Moreover, we were conscious about the need of formalizing the relationship of our group and the neighborhood association in a sort of contract, as stated in PAR literature. However, we postponed this formalization, as we wanted to wait until our project definition would have become more concrete.

2.1.3. Confronting ideas in a participatory workshop: the 'Taller de Ideas'

Very soon, we began to prepare a first workshop offered to the residents of the district, intended as a first opening of our participatory process, and that should at the same time complete the information we had obtained by that date on the district with the residents' perspectives (being the before mentioned report by the urban planning department of the UPV an already very complete source of information).

In the eyes of S.A., the workshop, and the TB's work in general, was moreover an opportunity for initiating a more participatory dynamic within the neighborhood association. In one email just a few days before the workshop[113], he told the group of a conflict that had arisen in a meeting of the association's board. A board member had questioned the participatory nature of a report that another association's member had drawn up in the name of the association. The reproach of not having sought the participation of the rest of the association members in the elaboration of the report was perceived as an offense by the person who had done the report: he explained that he had offered participation without receiving response. S.A. tells in his email that he then suggested in the discussion "that the association had not known how to dynamize a participatory process" and then "emphasized that this Saturday [they] could initiate a more participatory dynamic". 'This Saturday' was the day when the workshop would take place.

The workshop took place the 10th of June 2006, a Saturday morning. The district's residents had been invited with posters designed by D.P. that announced an "ideas workshop" ("Taller de Ideas"). About 20 residents assisted, most of them linked directly or indirectly to the association and covering different generations. In the workshop, the participants should elaborate an analysis of their district's potentials and limitations. We employed for this the

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[113] Email from S.A., 6-06-2006.

SWOT technique[114], asking for the Strengths and Weaknesses of the district, as well as for the Opportunities and Threats for the district's development coming from outside the district. Different exercises of individual and group reflection (figure 4.2) during four hours resulted in a collection of concerns and opinions for the above mentioned categories. In a first individual exercise, each participant listed on a sheet the strengths and the weaknesses of the district, and the external opportunities and threats. In a second exercise, the participants discussed their view points in small, heterogeneously composed groups. They wrote on colored cards the different aspects they decided to retain from their discussion (the color of the card corresponding to each of the four categories). In a third step, the different groups presented their SWOT diagrams and a common diagram was made up. The final discussion was concluded by an evaluation exercise. Here, each participant was given four adhesive points in order to score four aspects marked on a dartboard attached to the wall[115]: the participatory 'techniques' employed, the participation achieved through them, the organization of the workshop and its results.

Figure 4.2. A collection of photographs taken during the SWOT workshop that show its different phases. Source: Pérez and Chiner, 2009 (PowerPoint presentation).

The TB members facilitated the different exercises of individual and group reflection and discussion. This meant to help some of the elder participants writing down their notes ("you should have said that we should bring our glasses with us!", exclaimed one of the participants). In the second exercise, the TB members cared for a heterogeneous composition of the groups,

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[114] The SWOT technique is widely used in strategic planning and in participatory processes. It is credited to Albert Humphrey who used the technique in the 1960s and 1970s at Stanford University.

[115] This evaluation technique is described for instance in Taylor, 2003.

and each group included one TB member for facilitation and note taking; and two members of the TB facilitated the composition of a joint SWOT diagram in the big group.

The results of the workshop[116] were more or less in line with the report elaborated by the UPV urban planning research team TUR. They added to or contrasted the researchers' list of the district's problems given before in a number of aspects:

- Some participants stated a lack of parking places for residents (at the same time as they also considered the use of public space for parking exaggerated);

- The local 'politics of housing' were criticized for their lack of transparence;

- The construction of new housing was criticized for its low quality;

- A disinterest for the district on the side of public administration, visible in the lack of basic equipments for education, health and elder people;

- The bad conditions of the district's streets; and

- The lack of green areas.

The participants pointed at the same time to a number of strengths that can be summarized as:

- A large number of associations in the district and a potential of mobilization of the district's residents;

- A richness in culture and history, still present in a number of historic buildings and institutions, as for instance the carpenter's guild or the conservatory;

- The official existence of pedestrian streets and of regulations protecting the district's historic character, although not respected in practice;

- And the potential of the numerous vacant lots for developing the district.

As threats from the outside to the district's development were mentioned (in addition to those given by the TUR report and the above mentioned problems) the practice of expropriations and the recent plans for possibly extending the hospitality industry from the neighbor district El Carmen to Velluters. And finally, concerning the opportunities, the participants' list added to those already described the possible subventions and financial aid schemes that could be

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[116] See appendix B, document 2.2 ("Results from the SWOT workshop").

exploited; they also highlighted the potential of new residents coming to the district ("a district from zero").

The evaluation of the workshop by the participants was positive. Only the 'participation' in the event received a low score: some participants had understood that we asked here whether the number of participants was satisfactory and thought it should have been higher. Also the TB members felt satisfied with the workshop, as it had provided a rich space for discussion and apparently also for motivation.

In order to combine the results of the workshop with our own capacities and interests we elaborated matrices crossing the different sets of data and guidelines: the results of the SWOT analysis and those of the TUR report on the one side and on the other side the principles of *bioclimatic urbanism* (Higueras, 2006) to which we had oriented by that time our technical approach[117]. One of those matrices can be observed in appendix B (section 2.3). This crossing led us to differentiate between those topics where we could find a 'common interest' (highlighted in the appendix in yellow) and thus a base for collaboration, and those topics that did not match. Table 4.1 gives several examples for the first case: the left column contains a number of weaknesses detected by the residents *that we related to* certain strategies of bioclimatic urbanism shown in the right column. For instance, we related both the concern about the lack of parking places and the concern about inappropriate traffic and parking in the district to bioclimatic strategies pointing at a minimization of car traffic.

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[117] I also tried to relate these principles in another matrix to possible 'technologies' or proposals that we could focus. This was however not followed by any further steps of analysis in this direction.

Concerns of the participants in the SWOT workshop (examples from the category of 'weaknesses')	Strategies of bioclimatic urbanism that the TB determined to be related
- Lack of parking places - Traffic in pedestrian streets / density of traffic / accumulation of vehicles on the sidewalks and in front of the building entries	*I. Environmental pollution / transport* I.1. - Control and regulation of the environmental contamination, minimizing the use of cars in urban centers, promoting pedestrian use and public transport, etc. I.2. Transport policies that prioritize pedestrian traffic. (...) *III. Promotion of a diversification of activities and of the uses of public spaces* III.1. Promote the mixed uses and the diversity of activities concentrated in the central urban places, in order to reduce journeys and the consumption of energy in transport (...).
- Housing policy not transparent - Low quality in the construction of new buildings	*IV. Building techniques* IV.1. Promote building techniques for passive energy use (...)

Table 4.1. Examples of entries in the matrix that determined 'common concerns'.

This way, a number of strategies of bioclimatic urbanism were (indirectly) correlated with the residents' concerns. Other strategies did not show any such possible relationship, as for instance:

- "Minimize the losses of water in the potable water pipes due to infiltration and evaporation. Implementation of pipes of better quality and leak tightness of the joints".

- "Concerning the urban cycle of organic materials and residues, implement waste separation in organic and inorganic fractions in the homes, in order to permit differentiated recycling processes for posterior reutilization".

We labeled these strategies matters of "sensibilization" (highlighted in the matrix in the appendix in orange), that is, aspects where a whole process of interessement would have been necessary in order to work on them in the district. This meant in that moment that we would leave them aside and concentrate on the others, but that we envisaged coming possibly back to them.

Then there were those aspects that showed to be concerns of the residents, but that did not relate to any of our bioclimatic strategies. This was for instance the case of the problem of drugs dealing and prostitution. We will later see that neither did we entirely abandon them, nor did we integrate them completely into our analysis.

2.1.4. Parallel projects by students of the Universidad Politécnica de Valencia

At the side of these first steps taken by the TB to define the project, there were moreover two students of the UPV who contributed to the TB's objectives without forming part of the group and its dynamic. One started in fact almost at the same time as the TB did itself: M.Ct., a student of industrial engineering, developed in the frame of his final year project a proposal for a solar installation that could serve as a pilot project for a broader initiative in the district (Cascant, 2007). He developed that proposal for the building that S.A. lived in. This had been decided for practical reasons and for S.A.'s interest in mobilizing the homeowners' association of his building. This project responded to one of the strategies of bioclimatic urbanism ("Concerning the urban energy cycle, promote the use of renewable energies"). During the process, the mediating role of the TB and myself was not very clear: while the TB invited M.Ct. to discuss his project and integrate it into the general process of the group, he preferred to remain rather independent from our process. He presented his project for examination in the beginnings of 2007. It did not result in any process of implementation in the district as the initially targeted housing unit finally considered its implementation too expensive. This left the student slightly disappointed. He considered that the contact with the possible users of his project should have been managed better so that he could have elaborated a more realistic project. The TB discussed whether some follow-up could be given to the project, but the quality of the project's results was not sufficiently convincing for taking it further and we dropped the idea.

The second student, R.S., carried out an artistic intervention in the district (Serna, 2006), as part of her studies in fine arts. Having assisted to the SWOT workshop (which she filmed for us), she designed an intervention that would carry the question for the residents' concerns to the district's open space. She distributed posters on the district's walls with the message "Recognize your needs"[118] (figure 4.3), inviting the residents to write down their opinion, and later made an inventory of the responses. She understood her project as a contribution to our process, creating visibility, provoking reflection and adding voices to the ones heard in the workshop. Her participation was brief and inspired her to continue with an own agenda of

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[118] The entire text of the poster is: "Recognize your needs. What does the district Velluters need in your opinion? Here you have a free space to express your thoughts, write them down!" The responses were mostly anonymous and in line with concerns uttered in the SWOT workshop concerning the district's problems with delinquency, prostitution and parking. Furthermore, they included a statement about the (un)democratic nature of certain processes taking place in the district, signed by a person who had assisted to the SWOT workshop.

activism in the city center related to a group of artists she belonged to. Her group decided to focus on the demands for the creation of green spaces uttered by many residents in the workshop[119].
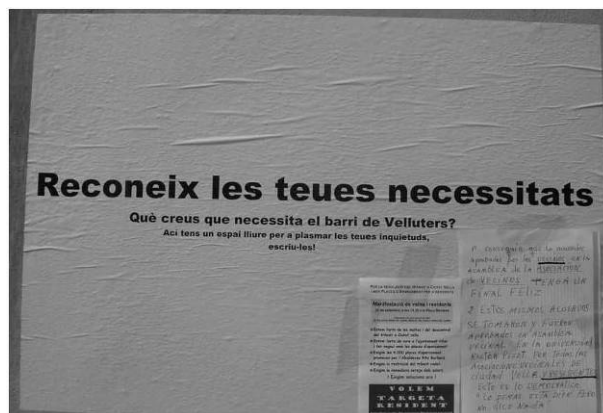
Figure 4.3. A picture of one of the posters distributed on the district's walls by the student of fine arts with already some reactions. Source: Serna, 2006

2.2.   Exploring the issue potential of the Velluters district

To summarize the following conclusions on phase one, the process can be considered to address now one potential issue, but one without a clear public to work with. It showed an interest in an articulation process. The definition of how this articulation should be achieved evolved during this first step from establishing and maintaining an expert-agenda to one of participation. The participatory agenda was very much oriented towards the search for possible publics. The process maintained its explorative character; it kept being informal (informal was the link to the association and informal was the link to the UPV) and was defined by a low-resource approach.

So let's start with the question whether the project definition aimed at working on an issue and its diverse publics. We have seen that the first draft envisaged a research process that should contribute to advancing local solutions to the global energy problem. The project addressed thus clearly a broadly recognized problem lacking of appropriate solutions and with a diversity of actors claiming for a better settlement. The project was however not linked to specific *publics* organized around this problem. What in the beginning had seemed to be a potential public (the neighborhood association that was mobilizing around several problems of the district) turned out not to be a public concerned with the energy problem. The process envisaged thus the mobilization of a rather vague general public that would engage in the

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[119] Personal communication, 21-02-2007.

process. In the workshop, some residents had mentioned a potential of mobilization in the district, so there was expectation and hope in this sense. Our project therefore aimed at engaging with a public that was yet 'to be found', and that would make our potential issue a real issue.

The project meant to articulate this potential issue. The project's approach was socio-technical in intention: the generation of the local energy solutions would necessarily need to be anchored to local actors and to the local reality of the housing park and the district as well as to companies of the sector of renewable energies; more so, it would consist not only of technical solutions, but also of a social dynamic of "critical learning" processes within the actors. Consequently, the project may be interpreted as aiming at an articulation of the issue by gathering a diversity of actors and by confronting them with the complexity of the issue.

At the same time, the project was rather undefined or ambiguous concerning the way how this articulation should be achieved, and what role the different actors should play.

- The **draft's** contents show a rather expert-based approach: participation was somehow naively thought to fit into the technical approach. It was meant to ensure good, realistic proposals and also their implementation and appropriation by the residents. The draft did not suggest making also the project definition itself participatory, that is, opening the very framing of the project[120]. The TB had a clear own agenda and offered participation in this agenda to the association and in intention to a wider public - it offered a frame that was accepted by the community group. This produced an attachment to the neighborhood association, and this attachment was soon also linked to an agenda of change within this association that should be the door to a wider participatory dynamic in the district. So already in this first moment, it seems to be complex to tell what participation could and should be in the TB's project.

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[120] In my efforts to concretize our participatory approach, I had to struggle with the fact that our project did not meet the **PAR principle of a demand-driven research**. Seen from the demand-driven perspective, our process could be either 'wrong' if the demand-driven approach would be considered a normative perspective (that is, if we want to work against asymmetries, we should not reproduce them in our very project: the principle of demand-driven research is then charged of political significance). Or it could be 'risky' if it would be considered an instrumental perspective (that is, you cannot make a participatory process when there is no mobilization behind). To go on with the process meant to judge that our approach was neither normatively wrong nor impossible but that it was worth a try.

- The **SWOT workshop** responded to a decision to open the definition of our process. We could have preferred to stick to our frame, for instance by starting to explore the district for actors interested in working on the project as we had defined it, or also by reacting on the local bank's call for receiving funding. Instead, we decided to first widen the focus, invite for a participatory workshop in order to orient the process towards the particular situation and needs of the district, its people, and the neighborhood association.

- The invitation for the workshop through the posters distributed in the district was meant to attract such residents that could have already some interest in the problems of the district. The posters announced an *ideas workshop* – ideas for improving the district's situations. In their design, we had been conscious about the importance of the message and of its form and had discussed how we would manage to attract people and transmit our idea. The people that finally attended the workshop were in general linked to the association and came explicitly through the mediation of the association's president – the posters had not worked too well in this sense.

- The SWOT technique was chosen because some of us were familiar with it and because we considered it an appropriate technique for starting a participatory dynamic. The particular format of the exercise that we had developed for the workshop was meant to produce some new insights on the district's situation in order to complement the overview given through the TUR report; but it resulted primarily to be an instrument for identifying and connecting to the residents' *concerns* – to possible issues with a public potential in the district that we could possibly relate to our own issue. Participation was given here a double status: between a *consultation* and an *offer*, as the workshop was also meant to be a social event and a point of departure for the desired participatory dynamic. It was a consultation about the audience's concerns and perspectives on the district. We considered these concerns to be possible attachments, that is, possibly mobilizing. The consultation about the concerns became therefore a consultation about the mobilizing potential of the district.

- In our application of the technique we corroborated *the unit of the district* as our unit of analysis, asking the participants to note their ideas with regard to aspects within the district, and aspects influencing the district from the outside. The use of the technique

confirmed thus the assumption made in the very beginning of the process that the district may be taken as a unit of analysis and action in our participatory research process.

- In the interpretation of the workshop's results through the **matrices** we used the concerns and opinions uttered by the participants for adapting the project's focus. We decided to select topics of 'common concern'. Their identification was a matter of adaptation and translation: it was to make the step from the lack of parking places and a difficult traffic situation as described by the residents to the bioclimatic principle of the minimization of car use; at that moment the frame of bioclimatic urbanism still seemed to condition the process. This frame was modified, as we decided not to work on the aspects in need of 'sensibilization', as we called those aspects we considered important from the view point of bioclimatic urbanism but that did not appear to concern the workshop's participants. At the same time, the translation of the residents' concerns to our frame meant to translate the 'hot issues' in the district to less politicized but rather technical questions. The group focused on questions where the TB could contribute through the creation of knowledge and the generation of proposals.

- The suggestion that our project would be in need of an **artistic ingredient**, that had come from Arquitectura y Compromiso Social, had been put in practice rather by coincidence through the project of the student of fine arts who made her contribution by taking our questions for the SWOT workshop to the streets of the district. Her project was possibly trying to connect to a more 'general' public, which did not come to the SWOT workshop – the commentaries left on the posters were very much in line with those obtained in the workshop. However, she continued afterwards her path; also here a decision was taken not to get more intensely interested in the role of art for our process.

The **TB's identity** that becomes visible in its first steps was one of a group of technical 'experts', that followed their own agenda. This agenda was thought to be at the same time flexible and malleable, adapting to the district and its people thanks to the inputs from participation. The TB became an *informal* partner for the association – a formalization of the relationship and the project was foreseen but postponed until there would be something more

concrete to formalize. Thus, the TB maintained the exploratory character of the process in response to the complexity of the tasks the group had chosen to work on.

The low-resource frame given to the project made the envisaged work load repose on the free-time capacities of the team members, as well as possibly on the academic possibilities of my PhD research. Also the link to the UPV was an informal one. It was performed on the one hand through the engagement of the UPV students including myself that participated more or less intensely in the process. On the other hand, the role of the TB in the project on renewable energies was reduced. Although the project was in principle related to the TB's goals, it stayed detached from the TB's process. Here, the student stated, when looking back on the project, that he would have expected the TB to play a kind of (inter)mediating role (similarly to the DTU Science Shop); during the process, it was yet not clear at all how this role could or should have been fulfilled.

3. PHASE 2

To continue with the description of the process, our matrices had helped classifying the topics arisen in the SWOT workshop and in choosing particular areas of common concern. After this selection, we had a still rather wide range of topics that we could concentrate on. Our next step was then directed to the goal of preparing a collective decision on the topics to choose for elaborating concrete proposals for the district. We undertook therefore an exhaustive data gathering on a number of selected topics and we visualized this data for presenting it in a second workshop to the residents. This should make the ground for a collective decision to take place. During this period, the TB grew with the incorporation of two new members, one of them also a member of the neighborhood association. The TB experienced however also an incipient instability. The relation with the association's board relied during that time mostly on the shared members of both groups.

3.1. *Preparing the ground for the emergence of concrete projects*

3.1.1. The team grows and its expertise diversifies

As for the TB's growth, two persons joined the group in autumn 2007. The incorporation of M.C. increased the presence of engineers with a social interest: similarly to J.A., she had studied at the UPV but was already professionally active, so that she started to participate in the group in her free time; she had also been a volunteer in the same NGO that J.A. pertained

to. The second new member was a geographer and recent member of the neighborhood association: when the group began to envisage a representation of the data to be gathered in cartographic format (that is, on the district's map), we invited him as an expert in cartographic work to help us. He began attending the meetings and was soon part of the team. D.P., the architecture student, had by that date finished his exchange year in Valencia but had managed to focus his final year project on our process so that he could continue working with the group.

After the incorporation of Jp.A. partly as a result of our interest in cartographic instruments, the process started to show a growing emphasis on data gathering, analysis and visualization. The group began dedicating considerable energy to this aspect. This fitted well for D.P. in his final year project, who worked on graphic representations with AutoCad and other tools used in architecture; with the help of Jp.A. I refreshed my skills of handling a particular Geographic Information Software; S.A. and M.C. concentrated on the tasks of data gathering and systematization. J.A. expressed in one meeting his concern that a too strong emphasis on the cartographic aspect could make our process drift off course. He reduced in the following period its assistance to the meetings, but kept working on aspects of the project related to his field of expertise and the original goals of the process.

3.1.2. The process focuses on data gathering and its visualization

At that time, the group started with a broad process of data gathering. It was discussed whether we should further restrict the topics with respect to the selection made after the SWOT workshop. We decided not to do so but to undertake a rather ample data acquisition, according to the following categories: vacant lots, traffic, prostitution, housing (especially state subsidized housing), the protection of the historic heritage, noise pollution and green spaces[121].

With this started a period of establishing the data needs for each of the selected topics, searching the corresponding sources and elaborating maps and other graphic forms of representation for each. Using geographic information system (GIS) software we were able to carry out spatial and thematic analyses of complex data sets, by creating layers of subsets of data that could then be combined or intersected. Moreover, the GIS software allows to

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[121] See appendix B, document 2.4, which shows the categories and variables defined for the data gathering.

represent the resulting interpretations in the form of maps (see figure 4.4 for an example)[122], a feature we made exhaustive use of:

-   We created maps with the vacant lots in the district, giving special attention to their "age", as a large number existed already for more than ten years; another graphic showed the total percentage of vacant lots (11,5% of the district's surface);

-   We contrasted the space officially dedicated to public parking with the space that was officially closed for traffic. We highlighted here the incoherence in the proper planning documents that curiously located public parking spaces in pedestrian streets;

-   In parallel we contrasted the official planning concerning the pedestrian streets with their real use, most of them being pedestrian only on paper;

-   We documented the traffic load, trying to make sense out of official data in order to show which parts of the district suffered important traffic loads;

-   We made an inventory of the buildings that officially enjoyed some degree of protection due to their historic interest;

-   We mapped the existing green spaces;

-   We located the course of the nowadays mostly forgotten irrigation ditches once existing all over the district, as we considered that their memory would be significant for maintaining the district's historic heritage as a site of silk manufacture;

-   We mapped the availability and distribution of social, sanitary and cultural public equipments, pointing out their distance from the district's center (see figure 4.4 and the colored version in appendix B; the center is marked by the black building in the middle of the blue-marked district and the distance is marked by the circles). This evidenced not only that the district did not dispose of any such equipments and relied on those available in the neighbor districts. It also showed the large distance to sanitary equipments, which was problematic given the high percentage of elder persons with their particular needs for sanitary attention and their reduced mobility.

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[122] See equally appendix B, section 2.6, for a selection of the generated maps and graphics.
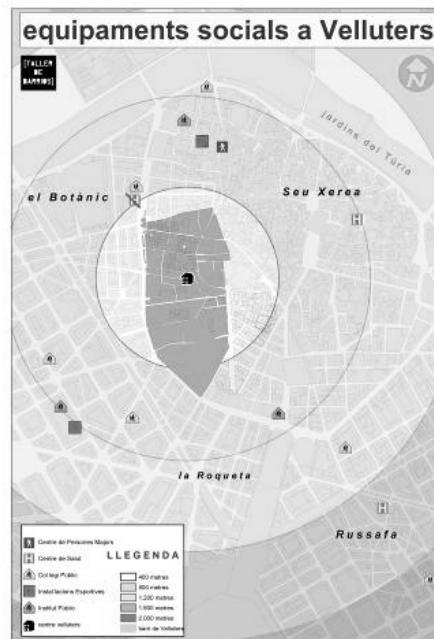
Figure 4.4. The map about the equipments that the district relied on. Source: archives of the Taller de Barris.

We also elaborated graphic representations of the data gathered about the population and its living conditions. With regard to the before mentioned concern about the lack of population, we found that in fact more than 50% of the available housing was unoccupied. With respect to the living standard, we found furthermore that more than two-thirds of the population lived in rented apartments, that more than 50% were living alone, and that 97% lived with an income less than 1,5 times the guaranteed interprofessional minimum wage ("salario mínimo interprofesional").

S.A. and Jp.A. filmed the district from a car driver's perspective, documenting how a car driver was able to totally disrespect the pedestrian streets.

J.A. concentrated on elaborating sophisticated simulations of how possible proposals realized in the district would look like (figure 4.5). He also elaborated a representation of the district and its surroundings in three dimensions for studying the sun exposure of particular spaces; this was relevant for developing proposals of public spaces that would be attractive to the residents offering shady places in summer, as well as for proposals dedicated to the improvement of the energy efficiency of the buildings.

We did finally not produce specific data on the issue of prostitution. With respect to the housing conditions, we had focused on historical buildings leaving aside the question of social housing.

Figure 4.5. A simulation elaborated by J.A. showing the use of urban furniture for avoiding parking in a pedestrian street - left: real situation, right: simulation. Source: Pérez and Chiner, 2009.

By that time, the architecture student, D.P., had created a website for the group: a wiki[123] that we would use as a collaborative workspace in Internet and that would serve also for making our work visible and accessible (www.tallerdebarris.wikispaces.com). During the following years, this wiki would lead to some contacts with people following our process. In fact, we received very early a first email on behalf of the wiki, where someone called our attention upon the permissions to edit the page: the initial design of the wiki had permitted making changes to anybody who would like doing so, and we were asked whether this was truly the editing policy we wanted to adopt. We soon restricted the editing permit to registered users of the wiki; over the whole process this group coincided with the TB members.

The exhaustive diagnostic work we carried out during autumn and winter 2006 was initially thought to include the residents' participation, as we had suggested in the initial outline of the project. However, although we dedicated some discussions on how to achieve this participation, we did finally not arrive at materializing it into concrete actions but postponed it to a later moment – after a second workshop through which we thought to have achieved the engagement of some residents around some more concrete issues, so that these residents could then be integrated into the process of data gathering and analysis.

3.1.3. Communicating results in a second workshop and

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[123] A wiki is a website that can be edited by an unrestricted or restricted number of persons and may be this way a collaborative tool for information exchange and management.

making proposals

This second workshop took place at the end of March 2007, again on a Saturday morning in the premises of the neighborhood association, and again with an invitation through a massive mailing and the distribution of posters designed by D.P. on the district's walls. We presented the above described material, grouped in **three strategies: (1) mobility, (2) public space / free urban spaces, and (3) architectural techniques**[124], together with outlooks on possible ways of dealing with each topic, drawing from examples from other Spanish or European cities that responded to the challenges we had detected. The participants in the workshop were invited to receive first our PowerPoint presentation containing these materials. Afterwards, they could take a closer look on the same materials disposed on a number of exhibition panels, organized according to the above mentioned strategies, in order to discuss them and make commentaries and suggestions on an extra panel for each strategy asking for commentaries (figure 4.6).

The participation in the workshop was less intense than in the first workshop: although maybe not quantity-wise but less constant, perhaps due to the badly chosen day and time as some of the participants told us later. The participants made commentaries concerning two of the three strategies: that concerning public spaces and that concerning mobility[125]. They mentioned a number of actors with whom the TB should seek collaboration; they suggested aspects to concentrate on; and they proposed activities for doing so. The workshop awoke the interest of some residents in our work and in possible participation, and also from one association working in the district with children and young people belonging to marginalized groups.

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[124] We included here for instance urban gardens on the roofs of the district's buildings, or aspects related to energetic improvements of the buildings.

[125] The document "Results from the second workshop" (appendix B, document 2.7) contains the commentaries made by the participants.

Figure 4.6. A collection of photographs taken during the second workshop. Source: Schlierf and Pérez, 2007 (PowerPoint presentation).

A first moment of drawing conclusions from the workshop was the lunch directly afterwards. There, in an enthusiastic spirit four of the TB members made a brain-storming on creative and playful activities to continue the TB's work in the district in response to the workshop's results[126]. A second moment was then the proper evaluation carried out in a meeting of the TB several months later. The TB evaluated the following aspects: the workshop's preparation; its announcement; the group's functioning in the preparation; the development of the workshop; the degree and kind of participation; and the feedback for the TB. Negative aspects mentioned were that the workshop had not been as successful as desired in attracting the district's residents and representatives of small commerce of the district. More so, the format of the workshop (the communication style, the time frame, etc.) had shown to be partly inappropriate. Furthermore, the workshop had shown that the TB had not been successful in communicating its work to the association's board. A positive aspect was the good functioning of the TB. Equally, the workshop had produced a good feedback from diverse actors, as well as an increased interest in its website.

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[126] The brainstorming's results: "pintar propostes en façans i murs; fútbol: amaltea, solares; inauguració d'equipaments per al barri (prensa, veïns); proyecció i exposició física al carrer; concert: pirats sound sistema, gent de l'associació; cinema d'estiu; tallar el carrer; slow city – senyalització; video gent major; proposta hort c/vinatea: recollir firmes dels veïns; ..."

Both the preparation of the workshop as the evaluations and inspirations deriving from it fed the planning of the further process. They also nurtured the academic activities related to the process, which I will describe in the next pages.

3.1.4. The academic side of the Taller de Barris

The architecture student, D.P., was working during the time of the preparation and celebration of the workshop (winter/spring 2007) on finishing his final year project that he presented for examination in May 2007. He elaborated part of the cartographic material described above for this purpose. In order to be able to use this work for his final year project, he had to convince however first the supervising board of his school of architecture, which was not at all used to socially oriented projects without constructive elements. He finally was successful in this effort by introducing a constructive aspect into the project – an architectural proposal that went beyond our work and scope of activities but that was needed for being admitted to examination. His project did not only pass the test but the "skeptical examining board" appreciated the outcome and expressed its support in case that other students would like to engage with the district[127]. His project was in line with theoretical perspectives employed at his faculty about urbanism but had been a kind of pioneer in linking them to the practical proposal of participatory action research; it soon induced fellow students to undertake similar ways [I19].

D.P. documented his work, and partially our process, on a blog[128] that he had created for this purpose and that he continues nurturing until today. His blog shows a sequence of summaries of his project elaborated along the year, where he documented our process and advanced his architectural proposals that sought to give imaginative and integral solutions to the complexity of the district's situation. The graphic represented in figure 4.7, part of his final project, shows how he tried to propose a coherent and integral set of interventions addressing the whole of the district.

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[127] Personal communication, 13-05-2007.

[128] The blog, named "Aterciopelado"(velvety), is to be found at http://velluters.blogspot.com.
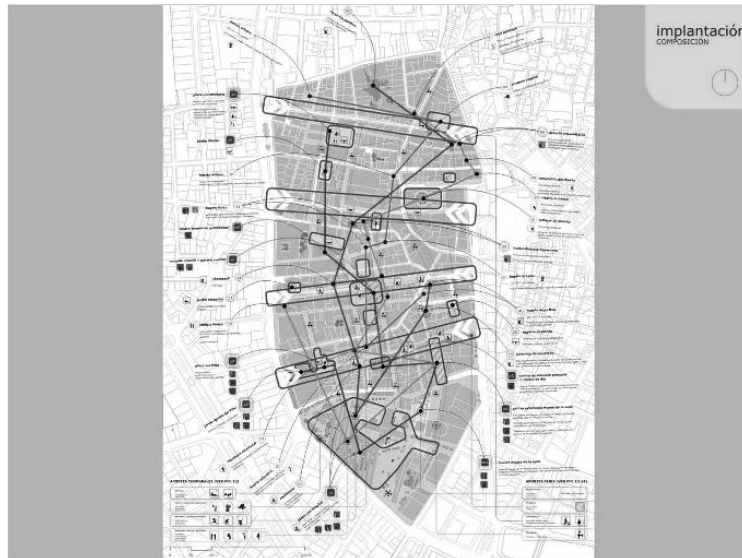
Figure 4.7. The representation of the set of solutions developed by D.P. for his final project. Source: Pérez, 2007

His representation of a comprehensive program for the district was then used for visualizing the current working perspective of the TB. In order to tackle the complexity of the district's problems, a double strategy would be needed: offering the residents' collaboration to administration, and creating pressure for accepting this collaboration. It would be necessary to work on the one side on constructive proposals for improvement directed to decision makers and residents; on the other side playful and creative interventions could make existing conflicts about the district's development visible and give an opportunity for mobilizing the residents. This way, the comprehensive-in-intention, but still abstract, vision of a better district should slowly be concretized through small initiatives attacking parts of the whole; these small initiatives should address the politics of local urban planning in different forms, using "invited" (existing, official) spaces for participation and creating new spaces for claiming participation (see figure 4.8)[129].

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[129] We made here reference to the distinction made by Gaventa (2006) between invited and claimed spaces of participation that we have briefly introduced in chapter one.
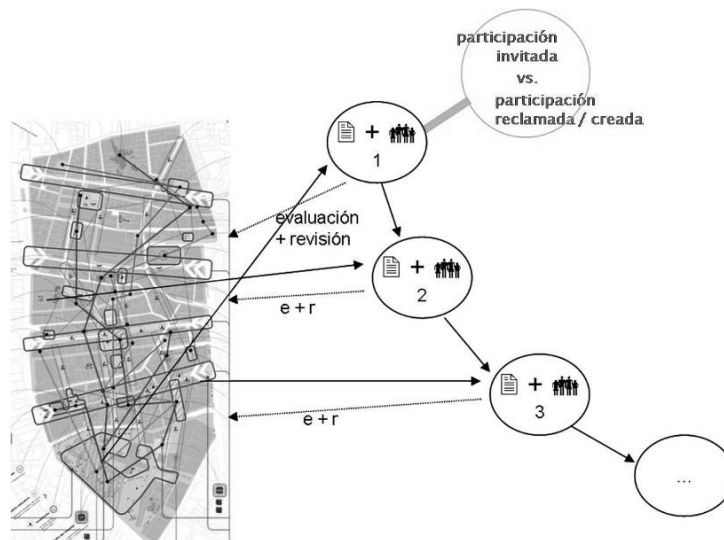
Figure 4.8. The representation of how the diagnostic of the complexity of the district could be the basis for consecutive steps of participatory events, combining constructive proposals and social events. Source: Schlierf and Pérez, 2007 (PowerPoint presentation).[130]

This was the perspective expressed in the first academic paper about our work that the two students of the group presented in June 2007 in an academic seminar about historic downtown districts (Schlierf and Pérez, 2007). The theoretical frame adopted in this paper is one of 'urban ecology' that we defined as including still the technical aspects addressed by bioclimatic urbanism but also social, economic and political aspects. Among the otherwise positive reactions, we received also one quite critical commentary of the professor of urbanism who had organized the seminar. He questioned the viability of our participatory approach, as in his eyes our intents of promoting a participatory process without counting with an already broad mobilization was doomed to failure.

By presenting the TB at this seminar and also in other scientific forums, I promoted the academic side of the process[131]. At the same time I had decided by that time to focus my PhD research on other experiences that would deal more clearly with 'technologies'[132].

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[130] The oval forms in the graphic carrying the numbers 1, 2 and 3 represent participatory events that move between invited and claimed spaces of participation (making proposals, as shown through the symbol of a document, and being associated to a social dynamic, as the other symbol illustrates). The graphic thus represents an adaptation of the action-planning-evaluation spiral as proposed by PAR literature (Zuber-Skerritt, 2001) to our particular project.

[131] I presented the TB also at the Living Knowledge Conference in Paris in August 2007 (Schlierf, 2007). There, I framed the process under the perspective of *urban ecology* and offered an analysis for the challenges our group had experienced in trying to promote a CBR process on this topic in the city center of Valencia. Interestingly, I received precisely from the coordinator of the DTU Science Shop a critique concerning our way of dealing with the parking issue. I had mentioned the topic rather incidentally, as an example for the slight NIMBY character of the residents' claims (see earlier discussion about the NIMBY concept in chapter two). He asked then whether we had sought to

3.2. *Visualizing the district's potential in terms of issue articulation*

In summary, we see that the process continued addressing potential issues and aimed making the ground for a mobilization around them. In the search for such potential issues, the original concern with generating proposals guided by the principles of bioclimatic urbanism faded into the background. The group focused on a diagnostic work, employing cartographic tools that allowed an exploration of the district's complexity and its translation into visual material. This technical work was accompanied by the simultaneous development of a holistic strategy for confronting the politics of local urban planning. The TB confirmed its identity as a group of experts and started to develop an academic side.

This phase was characterized in its very beginning by an important bifurcation: the process could either focus on the gathering of data, its interpretation and visualization in order to create a more informed base for participation; or it could focus on the elaboration of concrete proposals. The group opted for the first path, a decision that responded also to the new capacities of the group. The question of bioclimatic urbanism lost importance in the group's agenda. In my academic communications it transformed to the wider and less technical paradigm of urban ecology.

The team concentrated accordingly on data collection, analysis and visualization in relation to a number of problems addressed by the residents: potential issues that could possibly motivate the district's residents for mobilizing around them. The range of aspects was intentionally maintained broad, in order not to reduce at an early stage the complexity of the district's problems and also to increase the chances of covering an aspect that would be able to provoke the desired mobilization. Although according to the initial frame this period had been envisaged to be already done in a participatory way, it finally came to be basically a *preparatory* phase, one that would set the ground for participation.

The phase was characterized by a very technical work. We employed in this sense a number of tools for data gathering and handling that responded to the particular skills of the team's members. These included different software, such as the wiki software, AutoCad, GIS and simulation software. We hoped that while responding to our technical capacities, these

create some kind of confrontation about the residents' perspective about this question – a thing we hadn't done.

[132] I had decided to do the field work at the Science Shop of the Technical University of Denmark where I was supposed to find more technology-related CBR processes to study. In contrast, as the reader knows, finally the CBR process that I have chosen to study in more detail out of the DTU Science Shop's projects deals with *urban planning* just as the TB's process did.

instruments would be sophisticated means of communicating our work to the residents. We did not use the participatory potential of some of the tools, which are documented in particular for the wiki and the GIS software[133]. In our process, the wiki's function was to make our work visible and to be at the same time a tool of information management internal to the TB. The mentioned limitation of the editing permits made this internal use explicit, as for being able to participate in the wiki one would need to be approved by the TB members. Concerning the GIS software, it was for us a useful instrument for the simultaneous interpretation of the district's situation and the communication of this interpretation (its translation into maps and graphics), and especially interesting for capturing the *complexity* of the analyzed problems in this sense.

This step came thus to be a very accurate proxy of the different topics that we had preselected, hoping for the second workshop to make the desired connection to a mobilization around one particular topic. The group avoided focusing before on any of the topics, also on those that had shown to mobilize the residents. In the case of the parking question, we did gather information on traffic and mobility and offered this as one possible focus point which *included* the parking question; but we did not shape our approach according to the existing mobilization.

The contact with the association during the phase of data gathering and analysis was a rather technical one; the process continued being formally attached to the association but there was little interaction beyond the contact given through the two common members. Also the participation of the residents had been reduced to a second workshop, so that there was no other official moment of interaction with other residents.

The second workshop had been thought to become the moment of materialization. The participation of the residents was here framed as one of receiving our information and giving feedback on it: the participants would take this way part in the shaping of the TB's approach but they would not decide over it. We continued thus to offer our expertise and to hope for the residents to attach themselves to some of the aspects to play out their mobilizing potential. This did not happen – we were still dealing with a number of potential issues still without publics.

The process stayed this way very much expert-driven. The TB *adapted its approach* according to the results from the workshop. The evolution of the approach responded also to the

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[133] The use of wikis as tools of collaborative information management is well known through Wikipedia and similar famous wikis; also GIS software has a trajectory of participatory usage (Forrester and Cinderby, 2005).

circumstances and to the diversification of the capacities and the interests of the group's members. The decision to orient the process towards an exhaustive cartographic work showed the difficulties of the group to put the technical process into practice at the same time as advancing in the participatory process. The double strategy of combining an approach of negotiation with a more militant one as outlined in figure 4.8 shows that the group recognized the complex interrelation of social, political and technical aspects. In practice, the group worked in a very technical and expert-oriented way, considering this a preliminary step to the truly participatory process.

The goal of producing a 'different relationship' of university to society was in this phase mainly performed by D.P., who was rather successful in this respect at his university in Alicante. His unusual project managed to convince his university, and not only create interest in our process but also to open the door to similar experiences for his fellow students. My own involvement continued to be uncertain between an activist involvement and an academic one.

The general project of transforming university research proved secondary: although the group was still linked to the project of establishing a science shop at the UPV through my involvement, our goal was clearly to follow our project in the district Velluters. An implicit decision was taken not to focus on the (inter)mediating role, as it had proved in fact rather difficult to integrate the academic work of a student that would not engage further with the TB. We did however promote an academic side of the TB's identity, bringing the process to different forums for discussion. This meant a potential of reflexivity and of networking.

4. PHASE 3

4.1. *Focusing on one project and handing the process over*

4.1.1. A concrete opportunity becomes the group's focal point

Still occupied with drawing conclusions from the outcomes of our second workshop, in April 2007 we came upon an opportunity for working on a concrete question. An underground parking should be built close to the premises of the neighborhood association, and the administrative process had already started. This project would convert a vacant lot on the street Vinatea and the adjacent area located on the top of the parking in a square. This square to be created was in our eyes a good opportunity to focus on, amongst other aspects due to its characteristic of being one of the main entry points to the district according to the numbers we had on pedestrian traffic. It was an opportunity to articulate, in one concrete space, the

different potentials of the district, and to integrate those elements lacking in the district (such as green zones to be used as public social spaces). It was an opportunity to demand from the local administration that they would have the residents participate in its design, by our and the association's intermediation. This third phase of the TB was thus driven by the goal to initiate a dynamic of participation about the question, by networking with the relevant actors and the elaboration of preliminary proposals to nurture a participatory process. The phase was however marked by the weakening of the group at the same time as the relationship with the association seemed to become rather conflictive.

So concerning the promotion of the residents' participation in the square's design, the most urgent was to get knowledgeable about the time frame of the corresponding administrative procedure and to understand at which moments we could try to promote participation. The project had been recently announced and the deadline for presenting allegations to the feasibility of the project was set for the end of the month.

The TB then initiated its "analysis of the potentialities of the public car park project Vinatea" (figure 4.9). We elaborated a map of actors in relation to the project that we would classify according to their affinity and their power over the situation, inspired by the technique of the "sociograma" proposed by Spanish PAR authors Rodríguez-Villasante and Martín (2006) for strategic reflection. Mid May we contacted the people and the association that had shown interest in the second workshop in order to suggest them to participate in the elaboration of concrete proposals; finally this did not produce any concrete participation. By the end of May, the TB assisted to a meeting of the board of El Palleter in order to present our work and propose the joint elaboration of a planning concerning the Vinatea project. The association showed to be interested in a common process. As a first step, the TB proposed via S.A. to the association's board to present a joint allegation to the City Council, demanding participation in the design of the top of the parking. This was approved and a joint allegation was put forward. As a further step, we outlined our participatory strategy, supported by the association: this was meant to engage the residents living close by the site in activities concerning the project. We aimed at starting negotiations with other actors possibly interested in order to build up alliances.

The TB contacted in this sense the *Colegio del Arte Mayor de la Seda*, the traditional silk guild located in an emblematic building close to Vinatea square, used also as a silk museum but at that moment under renovation. We presented them our ideas to include into the square's design references to the museum and to the history of the district as a place of silk production.

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The square could this way be used as an "open museum", that is as an extension of the existing silk museum into the public space. We visualized our suggestions with a PowerPoint presentation elaborated skillfully as usual by D.P. who contributed with this from the distance. Our discourse and the presentation should convince the silk guild to engage in our claim towards the administration for participating in the design. They did this by a supporting letter. However, they did not engage further.

Figure 4.9. A slide of the PowerPoint presentation used in the negotiations with the different actors.
Source: archives of the Taller de Barris[134]

As part of its exploration of the participatory potential of the Vinatea square's design, the group focused on investigating the official spaces of participation. By the end of June, the association received a response by the administration to the jointly presented allegation. The corresponding department referred us to the official frame for participating in the project, which would be the period of the public exposition of the preliminary design of the parking. However, we considered important to participate in the very early stages of the project definition, as the decisions taken on the features of the underground parking would condition the design of its top[135]. A contact in the local administration was helpful in investigating further possible moments and addressees for participation. He tried to identify which department of administration would be an adequate addressee for us, which was not obvious given the distributed responsibilities in such projects between the different departments. He recommended us to ask for an appointment with the city councilor of the Department of

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[134] The title of the slide says: "Analysis of the potentialities. The public car park project Vinatea".

[135] For instance, if the future square should be equipped with trees, these would need of sufficiently profound substrate for the roots, a feature that needs to be included in the very design of the parking's structure.

Traffic and Transport. It was the association's presidents who asked for the meeting, which finally took place before the summer break, with the attendance of some members of the TB, the city councilor and the technical expert in charge of the project. In this meeting, we brought forward our idea of converting the square into a multifunctional site that would articulate the district in a number of ways: by offering spaces for social and cultural purposes and by being a door to the district and its history.

At the same time as we sought to exploit the official paths for negotiation with administration, we developed ideas about a campaign to raise the residents' attention and motivate for engagement that we would start after summer, with a playful and artistic "pre-campaign" during summer. We assisted once again to the association's board meeting in order to propose this participatory strategy.

4.1.2. The relationship with the association turns conflictive

The way how the TB suggested addressing the issue did not provoke unanimous support in the association. S.A. reported that some members considered our attempts to negotiate with administration misguided, because of two reasons: first, they criticized that the TB was making proposal for the square on top of the parking "but had not thought for whom that parking should be" [I18]. They esteemed much more important to discuss with administration how they would allocate the new parking – for the residents or for a non-restricted public. Second, they considered that "the association should not make proposals but should focus on being critical" [ibidem], that is to say, that the only way to relate to the current administration should be one of opposition. In the eyes of S.A., member of the TB and of the association, this was a "dishonest critique". He considered that "these members would have been perfectly ready to negotiate and make concrete proposals" but that their critique was actually motivated by their perception "of the Taller de Barris as an element [that would] perturb, that would question (...) the mechanisms [of the association's functioning] preferred by these persons" [I18].

S.A. was referring with this to the link of the TB to a faction of the association's members that was aiming at a renewal of the association's democratic performance towards an opening and a less hierarchical organization. S.A. and Jp.A., the two members of the TB that were also members of the association, were part of this faction, and S.A. had envisaged in the very beginnings of our process that the TB could support this effort by contributing to a "more participatory dynamic" within the association, as I have noted earlier. The TB was thus involved in the association's internal politics, which produced a difficult situation for the two shared

members. They had to defend not only their own positions but also that of the TB when such critiques arose. The critiques were informal: they did not result from a discussion within the association's board but were expressed only in informal spaces[136]. It became necessary to address the role of the TB for the association, both rethinking it in the team and making the by then informal critiques to the TB a topic in the association's board. We concluded that we would need to communicate better our work to the association and its board. We decided to develop for this aim a leaflet of our work to be attached to the main door of the association's premises and a booklet gathering in an easily intelligible form our graphic material elaborated by that moment.

However, the summer break initiated a period for the TB characterized by instability and absences[137]. As a result, the plans for the summer and after-summer were delayed or not put into practice at all: the leaflet was not edited until the end of October; D.P. had to abandon his ideas about working on the booklet and on ideas for the pre-campaign and the campaign itself, as he was fully occupied with entering professional life after finishing his studies.

4.1.3. Setting the stage for a participatory dynamic

Nevertheless, the rest of the group resumed work after the summer pause. According to the information given by the administration before summer, during October the preliminary draft of the project for the underground parking would be elaborated as basis of the call for tenders; the awarded company would prepare the final project for starting the building works in January. These indications received by now were not very concrete about when our desired participatory process would fit into that procedure; more so, the time frame that had been indicated to us before summer could have changed in the meantime. The TB worked then on specifying how to proceed under this uncertainty, in coordination with the association's board. In a meeting in October 2007, the group decided to work "simultaneously on three fronts: first, to call administration to see whether this time frame was still correct"; second, to "sound out the companies that would normally be interested in being awarded such projects in order to see whether they would accept proposals made by the residents and the Taller de Barris"; and

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[136] We will see later that the board members that I interviewed for getting their opinion on the TB's work did not remember any such conflict.

[137] M.C. announced that she would be less available in the near future. D.P. returned to his hometown Murcia in order to search for a job after finishing his architecture studies. And I was leaving for a three-month research stay at the Science Shop of the Technical University of Denmark during autumn 2007.

third, to "call the residents for a meeting in order to explain them the state of affairs"[138]. The group decided thus to prepare an event for information and discussion that would take place in November 2007. It was meant to generate interest in the residents to join the association's recently created urban planning commission or to engage in some other form in a participatory process concerning the future of the planned square in the street Vinatea. By that time, S.A. considered that the TB itself should be reducing its role in this participatory dynamic or at most act as a support of such a dynamic rather than be the driving force itself, as he remembered in the evaluation meeting held some months later:

> "Because the approach, or at least the line in which I insisted, was that the Taller de Barris would end here, in terms of Vinatea. If the neighborhood association wanted to take this work, they had something [to elaborate on]. They could continue working on this, and be in a process of negotiation with the City Council." [I18]

This time, the chosen format for the event was a weekday's evening during two hours, once again in the premises of the association. The meeting managed to attract about 25 persons, a very satisfying number for the TB. The members of the TB (which at that moment were only three) gave a presentation followed by a discussion among the participants. The TB's presentation, that built on the ones used in the negotiations with the silk guild and the administration, gave an overview of the work done by the TB and focused then on the situation of the Vinatea project, which was presented as a "space of opportunity" for participation. They pointed to the circumstances that made this future square especially interesting for the district's development, and outlined its possible role for the district as a whole. They presented in a visually catchy way ideas and proposals for the square's design (see figure 4.10): the square as a point of information and a door to the district; green spaces with shade-giving installations; spaces that could be used for a variety of social and cultural events; and the introduction of references and uses related to the silk museum. They gave an outlook on the administrative procedure and the already initiated negotiations, and they invited for participation.

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[138] Email from S.A., 15-10-2007.
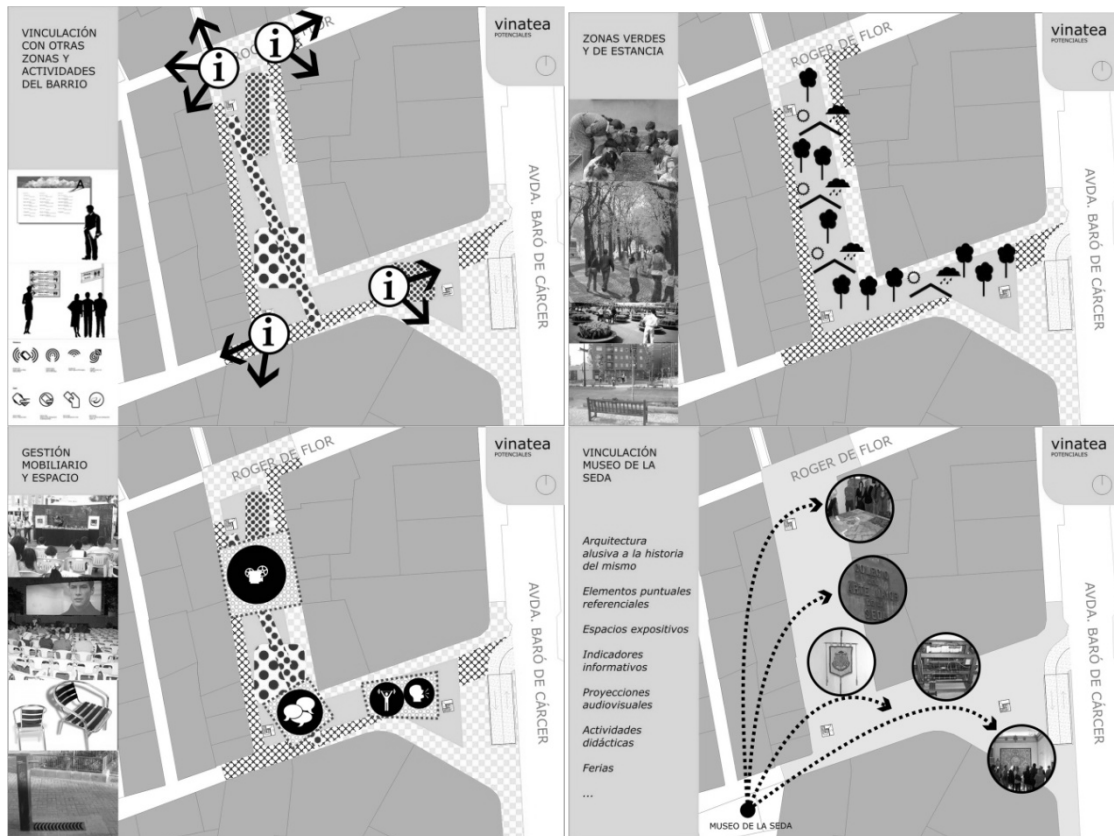
Figure 4.10. Some of the preliminary proposals for the Vinatea square. Source: Pérez and Chiner, 2009

During the meeting, one participant criticized the TB's proposal for not focusing on the actual question: more important than the design of the square to be built on the top of the underground parking was the allocation of the parking lots to the district's residents. This accusation was part of the before mentioned general critique of the TB's work. The status of this critique within the association's board was uncertain – although it was not the official opinion of the association's board, who had in fact approved the TB's approach to the question, it was the opinion of at least one board member and one person linked to the association but engaged in other groups.

The process provoked three of the participants to show interest in engaging in the process. However, in the aftermath of that meeting the TB began to disintegrate. The different members that were still active at that moment started to disconnect, and slowly the activity went down. By that time, the critical voices within the association or linked to it had started accusing the TB of not only acting against the association's interest by seeking negotiation with the administration, but even of pursuing its own self-interest, related to some of its members'

academic work, rather than serving the association[139]. The TB did not react anymore to this accusation. At the same time, the association proposed the TB to work on a mobility plan for the district, as the common member Jp.A. transmitted in one of the last meetings of the TB. But by then, it was only himself and M.C. left that wanted to go on working and finally the proposal was not taken further. By the end of April 2008, the TB had ceased activity.

The end of the TB almost coincided with its "second birthday", so that finally the group fulfilled the time frame envisaged at the moment of its foundation. This end could be seen as the closure of the process – yet to the eyes of D.P., our architecture student, it was part of an open story, as he describes on his blog where he documents activities related to the TB's work after this moment under the label "Fase 4. Código abierto" (Phase 4. Open source code). The end of the story or a never-ending story - we will see in the next section that both perspectives seem to apply.

4.1.4. After the Taller de Barris: uses and open threads

The materials generated by the TB and the initiated negotiations about the design of the Vinatea square were used in a variety of ways after the TB had stopped its work: they nurtured a workshop organized by a UPV student's association; the neighborhood association returned to the generated material and contacts a year later when the negotiations with the administration were resumed; it became the topic of a number of interventions in scientific forums; it was the empirical material for the academic exercises of a number of university students including myself; and it became a pilot project for an emerging science shop at the UPV.

One of the TB's final doings which can already be counted as 'uses' of its work was to support the initiative of some architecture students gathered in the university association *Arquitectura Se Mueve (ASM)* in a workshop about urban planning and participation. This was offered as an official course to their fellow students at UPV's school of architecture. The idea for the workshop had emerged from of my networking efforts between ASM and the members of *Laboratorio Urbano*, a group of Madrilenian architects practicing participatory urbanism[140] that I had known in the earlier mentioned seminar about historic downtown districts. It was just natural then to choose Velluters and in particular the Vinatea square as the site where the

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[139] Email from S.A., 15-02-2008.

[140] The Laboratorio Urbano was born out of the initiative of students of architecture at the Technical University of Madrid. After finishing their degree they maintained the group, now less linked to university than before but not less active. A presentation in English is given in aaa (2007).

participating students should work on in the workshop's practical part. The workshop, called *I Taller de Participación urbana* (1st Workshop of Urban Participation)[141], consisted of:

- a first, playful exercise in the district (a kind of scavenger hunt) that would make the students discover the district and its people, followed by a guided tour through the district offered by the neighborhood association's president;

- a conference by me, that introduced them to the district and to the work carried out by the TB on the Vinatea square;

- two more conferences introduced them to other theoretical-practical approaches to participatory urbanism: Patricia Molina presented the Laboratorio Urbano and Santiago Cirugeda his "recetas urbanas" (urban recipes);

- a practical exercise, occupying the largest part of the workshop and supervised by Molina and Cirugeda, where the students elaborated proposals for the Vinatea square. The students presented their proposals to the association some time later and organized also an exhibition about it in their faculty's premises.

This way, the material generated by the TB served as input for the students, and as one of its last efforts, the TB did some mediation work with the neighborhood association.

However, apart from their almost immediate use in the ASM's workshop, the materials generated by the TB and the open negotiation process with the administration stayed, at first, rather unnoticed. The material, containing data, analysis and cartographic production about the district, had not been assembled in a report or booklet as envisaged in the beginning. The negotiation process about the Vinatea square remained without further notice. This changed when, almost one year later, the administration finally turned to the association offering participation in the design of the Vinatea. The association's board showed then renewed interest in the material produced by the TB and by the students' association ASM produced during their workshop. Reassembled by S.A., who continued as an active member of the association, the material was put at the disposal of the association, who made use of it in the consequent negotiation process with administration, supported by some members of ASM. People showed "to be more interested than in previous occasions"[142]. The president of the association, S.A., and two members of ASM participated then in a meeting with the municipal

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[141] The workshop is documented on ASM's website www.arquitecturasemueve.org.

[142] Email from S.A., 17-02-2009.

architect responsible for the square's design, where they brought forward their different proposals. The architect showed interest in some of them and further meetings were envisaged.

Other ways of taking the TB's work forward were linked to the networking done throughout the process, for instance through our communications in scientific forums[143] and through the web site[144]. Links to groups and persons involved in similar initiatives in other parts of the country and in Valencia itself, as well as with ASM, produced further points of contact and collaborations[145], the latest being a seminar held in autumn 2009 on participation in urban planning in Valencia where the TB was invited to participate. The project forms furthermore part of the curriculum of an emerging science shop at UPV, Utopika[146]. This has done its first steps as a constituted group in 2008 and has initiated in February 2009 its first project.

The process has been further used by the different involved students for their academic curriculum. D.P. and myself, as the more involved students, were trying to integrate our engagement, that was initially ambivalent between a voluntary engagement and an academic one, into our academic tasks. This meant for D.P. to make some effort for finding a compromise between the requirements of the process and those of his university, which he however managed satisfactorily. In my case, I have obviously arrived at using the TB's process as empirical material for my PhD, as this very chapter documents.

4.2. An open-ended articulation

In summary, the process focused in this phase on *one* potential issue, and started the articulation of actors and things. However, its public was still uncertain, as the association showed to be ambiguous about it and the mobilization potential beyond the association was still to be explored. The TB was in this clearly engaged and active until the disintegration of the group. The material generated by the TB and the initiated negotiation about the Vinatea square were useful inputs for the association in order to take over the issue.

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[143] Schlief and Pérez, 2007; Schlief, 2007a, 2007b.

[144] The statistics that our wiki gives about its visitors show that in 2007 the wiki had as a maximum approximately 28 visits/day, 30% coming from the USA, and the welcome page received in total 552 visits that year; in 2008 the wiki had as a maximum approximately 25 visits/day, more than 50% coming from the USA, and the welcome page received in total 632 visits that year; the numbers for 2009 are similar.

[145] See here also Molina (2009), who discusses the Taller de Barris in relation to other Spanish experiences of community-based research in urban planning.

[146] www.utopika.upv.es

So, in this last phase, the wide range of potential issues was replaced by a particular potential issue. The TB considered that the question about the Vinatea square had an important potential of mobilization due to its strategic position in the district. The group's focus was bringing together a set of diverse actors that could show some possible interest, and was with this oriented to an articulation of different actors that did not necessarily share the same views on the topic. However, the public claim was here, as well, in part still an abstract one that had emerged from our thorough analysis carried out in the previous phase, that assigned the square a possibly important role in the district. It had been the TB again who had taken the initiative to work on this question, and it was the TB who provided the frame, that is, who proposed the square's design as the 'issue' to work on.

The TB's relationship with the neighborhood association was unclear in this respect. Although the neighborhood association's board had clearly subscribed to the TB's initiative concerning the Vinatea square, conflict or at least different perspectives seemed to emerge about how the topic should be addressed and what in fact would be the issue: the design of the top of the parking or the claim for a fair allocation of the parking places. It was unclear what meaning that conflict had within the association and for the relationship between the TB and the association. The critiques of the TB's work were not representative of the association board's opinion. They had rather the status of individual opinions on our process, but were not less influential or potentially important for the relationship of the TB with the association.

Looking backwards, the TB has contributed to some mobilization of the association around the design of the Vinatea square and has opened a negotiation process. Thus, it has achieved to produce a 'useful' result for the association, even if the degree of articulation of our proposals was lower than envisaged. However, to have produced this 'useful result' is a more modest achievement than the "critical learning" that our process should produce in the participants according to the initial draft. There was no space in the process dedicated explicitly to the confrontational work necessary for such critical learning. The envisaged playful, more militant activities in the district for claiming participation beyond the officially granted spaces could have offered such a space through a possibly confrontational dynamic, but had not been put into practice. Concerning the proposals, the process has enriched the available data around the district's problems, but it has shown to come however short in communicating the material elaborated. Still, the generated materials are apparently making their way into further processes linked to ours, making this last phase deserve the title of the "open source code" given to it by D.P. On occasions, the TB is even brought back to the scene, as for instance in the

recent seminar organized in Valencia. Its meaning for the UPV has become that of a possible reference and an experience to be discussed.

Concerning the TB's identity, the process focused on the action component of the articulation effort. The group became, together with the association, the dynamizing element of a claim towards administration and of a process of interessement and engagement of different actors. When ceasing activity it became a resource for possible future uses, in form of the generated materials and the open negotiation process.

5. A REFLEXIVE EVALUATION OF THE RESEARCH PROCESS

In this final section of the chapter, I will look back on the different observations made during the chapter on the quality of the process from the perspective of issue articulation. As my observations concern a process where I have been personally involved, this glance is necessarily a reflexive one. I will first introduce and discuss this dimension of personal involvement, which made me appreciate particularly the *uncertainties* associated to the process of the Taller de Barris. In a second step, I will synthesize the analyses made throughout the chapter and discuss them in the light of these uncertainties.

5.1. Adopting a reflexive approach

The analysis of a DTU Science Shop's CBR process from the perspective of issue articulation has shown the analytical interest of the dimensions of issue articulation. It has opened at the same time the question how far the perspective may serve for making judgments about such experiences, that is, for their evaluation. The description of the TB's process offered in this chapter shows the difficulty of establishing an 'objective' judgment on the process. The evaluation depends on *who* evaluates, *when* this evaluation takes place, and the *position* the evaluator adopts. We have seen this during the chapter, where I have pointed to the existence of different viewpoints on the TB's work both within the TB, within the association, and beyond. We have seen also in the very introduction to the chapter that the evaluation of the TB's work seems to be much more straightforward when looking back on the process than it was when being submerged in it. We have seen furthermore that my very own perspective on the process has evolved over the time. This evolution was related to the course the process took; it was equally related to my personal attachment or distance to the process, as well as to the development of my research project.

It may be then helpful to see this second aspect in more detail, that is, the evolution of the personal and theoretical position that I was adopting towards the process[147]:

In the beginning, my research perspective corresponded to a rather engaged and normative position: in the beginnings of my PhD research, I was supposed to explore the question how to promote at a technical university (as for instance the UPV) a 'socially and environmentally responsible technology transfer'. I decided early that I wanted to focus on the contribution of public participation in this regard. I considered that this was lacking at the UPV, producing an asymmetry, as R&D activities were increasingly linked to the profit-oriented sector while a connection to social movements was rare. I aimed therefore at integrating an action component into my research. This induced me to organize the workshop at the UPV about the possibilities of establishing a science shop at this university, which led then to the creation of the TB as a pilot project for such a science shop.

During the process, I experienced the difficulty of my project when put into practice. The collective experiment of the TB had me facing in person the complexity of this undertaking and challenged my normative position. I struggled with a number of 'frontiers' on which the definition of that normative position relied at the same time as it wanted to challenge them – for instance, the frontier between university and society (how far does it make sense to speak of a "transfer" of knowledge or technologies?) or between research and action, to name just two of them.

Directly after the process, I evaluated the experience rather negatively and I felt unsure whether it was of interest for being integrated into my thesis. Although the process was considered a worthy learning experience also by the other members of the TB [I18], it had been rather unsuccessful in terms of the initially envisaged outcomes and thus also as a pilot project for a science shop at the UPV. Looking back, it seemed to be clear that we had either failed to communicate appropriately or even aimed to reach impossible goals: these were the two types of reasons that I and the group mobilized after the end of the TB in order to explain its apparent failure [I18]. My interpretation of the process according to these two sorts of

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[147] This personal experience is one more illustration of the pragmatist perspective that this research suggests to adopt on science shop work: the very process of inquiry is a process of mutual shaping of the research object and the researcher; neither can the researcher be considered to document a stable, universal reality that the researcher can observe, nor can the researcher be considered as 'objective' and able of universal judgments. The very process of inquiry is a performative one that shapes the reality it seeks to describe at the same time as it shapes the interpretation of this reality brought forward by the researcher (Latour, 2007a).

arguments (in line with certain arguments brought forward in the TB's internal evaluation[148]) was:

- The first explanation was that the communication towards the district's residents and with the association had been insufficient and inadequate. We had communicated our work and results mainly in oral form and had not produced documentation on paper. Moreover, we had used rather technical and "spectacular" forms of communication in punctual events, possibly unsuitable to the audience [I18; I20]. As a consequence, neither the association nor the residents were conscious about the material elaborated by the TB that was at their disposal. It may have been difficult for the residents to understand our maps and graphics (shown for instance in the workshops, and available on the association's computer). This resulted in a low appropriation of the TB's work as well as in the possible manipulation of information in the association's internal politics - which had become increasingly conflictive during the TB's 'lifetime'. It had been the two common members that carried the load of communicating about our work and confronting conflict about it. This first explanation made me conclude that we should have done better – and that others *do* better, for instance by integrating artistic approaches in order to be creative and skillful about communicative aspects as we had been recommended to do in the very beginning of the process.

- The second explanation was that the TB's goals were not well conceived, too ambitious or even impossible to achieve. The TB had aimed at contributing to or producing a participatory dynamic in a district and on a topic characterized by a low or inexistent mobilization – which was doomed to failure as I had been warned when presenting the TB's project the first time in a scientific forum. Furthermore, it had sought doing so via the neighborhood association, apparently not a good space for producing a broad participatory process that should revert on the district, as neighborhood associations are "not very crowded spaces" and moreover spaces of power games [I18, J.A.]. This association such as apparently most of the neighborhood associations in Valencia was not able to mobilize the residents beyond punctual events concerning the district's hot issues [I18; I20]. This was not the kind of mobilization the TB had been looking for, as it wanted to go beyond protest by generating knowledge and proposals and to achieve a more constant participatory dynamic ("it was maybe easy to go to a demonstration, but to get involved into a process of the improvement of the district means

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[148] In the following lines I will expose the interpretations I made from the evaluation of the process by the TB members several months after the end of the process and by members of the neighborhood association's board [I18, I19, I20].

not just one afternoon a year" [I18, M.C.]). So possibly, the TB's "priorities were not those of the district" [I18, M.C.], although its work certainly met the concerns of the association and the district:

"I think it was and is of interest for the board, at least these topics are being on the table. That is to say, one of the concerns of the board is urban issues. I think that one of the concerns of the population of Velluters is the urban question. The lack of equipments and this kind of things, the crossing traffic, the mobility model, all that is of interest for the people." [I18, S.A.]

If it was not impossible to work on these issues in a participatory way, it was at least very ambitious – and improbable to be achieved with the low resource approach that the TB had adopted. A considerable amount of its energies went in fact into "orienting its work" and into defining its identity which was "constantly in evolution" [I18, J.A.] – such an exploratory approach would have required the appropriate resources.

So, the different aspects corresponding to this type of reasons seemed to indicate that we had failed in giving the appropriate frame to our project, and, again, that we should have been able to do so – such as I had observed for instance in the DTU Science Shop's practice, where I had seen a diligent framing of the projects according to the available resources. More so, the divergence of the process from our initial objectives appeared to be a matter of inconsequence and incoherence.

Progressing in the theoretical perspective on my PhD, I realized that instead of applying such an apparently self-critical regard on the process, I could possibly gain more from the experience when looking closer at the uncertainties involved in my judgments on it: taking seriously the difficulties of actually evaluating the process in its 'impacts' (When could you cut - before or after the reuptake of the negotiations between the association and the administration almost one year later? Should the workshop organized by the students of architecture be qualified as an outcome of the process?), as well as being skeptical towards the false clarity that the look backwards produces, pointed to by some of the TB members during the evaluation meeting.

These uncertainties showed to be related to more general uncertainties involved in science shop work. They concerned for instance the role of the university in the process: the fact that the TB resulted much less connected to the UPV than envisaged in the beginning and appeared to be much more an activist project than a collaboration between the University and the neighborhood association did maybe *not disqualify it as an object for studying science shop*

work. Maybe, it rather gave the possibility of analyzing the very exploration of what counts as spaces for science shop work. Moreover, it was a hybrid group, composed by members of the university, members of the association and others, all of them academics; it was thus a particularly interesting case for inquiring the project of 'connecting university to society' in the light of the very uncertainties concerning the definition of the boundaries between university and society (that has been an issue of academic debate in the 'mode 2' discussion, that I have described in chapter 1).

Another important aspect was the relationship of the TB with the neighborhood association. Under the earlier perspective, the TB had not managed this relationship adequately, resulting in a conflictive situation that could have been avoided through an appropriate communication strategy; in contrast, I started to consider the conflictive development of the relationship as rich in ambiguities rather than as an indicator of failure. This perspective was nurtured by the surprising affirmation made by two members of the association's board one and a half years after the end of the TB that they did not recall any conflict concerning the TB's role for the association.

Hence, I decided to integrate the process as empirical material into my thesis. The writing process led me to take the process *seriously in its decisions and indecisions*, in its insufficiencies as well as in its successes. This implied daring to *describe* the process although it would be always an incomplete description; to *evaluate* it from my particular theoretical perspective; and it meant to take it seriously as a *pilot project* for a UPV science shop, drawing conclusions from the experience for nurturing the existing project Utopika.

So my position has evolved from a normative, solution-oriented perspective to a rather analytical perspective that *problematizes* – with the hope that problematization may be an important step in the *construction* of future steps. This constructive character may lie in the potential of highlighting the choices that are made – consciously or unconsciously – in CBR work. This will be done in the next section. Their discussion will set the stage for chapter five where I will offer a systematic discussion of how far the perspective of issue articulation may serve for evaluating science shop work.

5.2.   Choices and uncertainties in issue articulation

First of all, I will synthesize the considerations made on the TB's process from the perspective of issue articulation, as I have done in the foregoing chapter. Table 4.2 offers a similar structure to that of the one exposed in the foregoing chapter: it follows the different steps of

the process with respect to the dimensions of issue articulation. I have added a further column that asks whether the process dealt with an *issue*, as this aspect, as well, has been evolving during the process. The second column details again how far the process may be understood in terms of an articulation of this issue, and the third column points out what kind of identity of the TB emerged in each step and how far this identity was being shaped by the process.

	Dealing with an issue?	Articulation through collaborative research?	The TB's identity
Beginnings	Two (potential) issues, focus on the 2nd: -one potential issue (transformation of UPV research), -the problematic situation of the district Velluters; the neighborhood association as a potential public.	-	In constitution; A being with many heads; A pilot project: a logic of exploration, of learning by doing, and of demonstration.
Phase 1 – Draft	One potential issue: the energy problem in Velluters; No clear public to start with.	In intention: the process aimed at articulating a diversity of actors (economic actors, social groups, university members) through a socio-technical approach; Scarce definition how this articulation should be achieved.	Experts in bioclimatic urbanism that aim at a socio-technical (participatory) approach: promoting an own agenda with the intention of letting others shape it; Involved in the association's inner life; Informal, exploratory, low-resource character.
Phase 1 - SWOT Workshop	Enquiring the district's issues; Creation of the frontier 'inside' / 'outside' the district.	Exploration of the district; Opening of the frame through participation (low profile participation: consultation).	Experts seeking to connect to some mobilization through consultation.
Phase 1 – Matrix	The TB's potential issue versus the district's issues:	The crossing of data: points of contact through	Experts adapting their approach according to

	searching for possible publics.	translation and interpretation.	mobilization potential; Staying away from politicized dynamics.
Phase 2 -Data gathering, interpretation, and visualization	In search for a common issue with a public potential (multiplication of potential issues).	The changing focus of the exploration follows the changing technical capacities of the participants; Gathering evidences with sophisticated tools, approaching complexity, enriching the knowledge about the district's problems; Not participatory; Envisaging an integral strategy combining a technical and a political approach.	Experts working with software; Influence from the outside is not sought; The process is brought to academic forums.
Phase 2 -Second workshop	Three strategies: three sets of potential issues.	Offering entry points to our articulation effort for the residents.	Experts communicating in order to get feedback.
Phase 3 -The participatory process about the Vinatea square	Concentrating on one potential issue (does the association count as a mobilized public?).	Articulation of a diversity of actors around a particular space; Negotiation; limited confrontation (critical learning?)	Networkers, negotiators, and again experts; A partner of the association towards the outside; No desire to be shaped but to hand the process over.
Phase 3 –Ceasing activity and passing on the process	The association sticks to the issue.	Abandoning the articulation effort; A useful result.	The TB becomes a resource and a reference.

Table 4.2. Synthesis of the observations made on the work of the Taller de Barris from the perspective of issue articulation.

5.2.1. The issue - between definition and exploration

The table shows the evolution of the different dimensions along the process. First, we have seen that the approach to the **issue** was one of a progressive approximation to a possible issue-public dynamic - the exploration of potential issues in the search for publics.

The process had started with *two issues* that the project was sought to explore as a pilot project for a science shop at the UPV – the question of a transformation of university R&D activities which was rather a *potential* issue, being ourselves in some sense a potential public for it (I will come back to that later); the question of urban development in the district in Velluters seemed to be a tangible issue with a mobilized public. The process focused then on one potential issue that did not, by then, dispose of a clear public: the problem of energy consumption in the district. So we had first our issue, which was still very abstract, and hoped for a public to appear, to *agglomerate*, it could be said figuratively, around the participatory events offered in this sense. The frame given to our potential issue evolved along the process: in the beginning, the potential issue was framed in terms of 'bioclimatic architecture', a field where J.A. was trained in and about which also I had some knowledge. At the same time, it was framed in terms of an inside/outside distinction of the district, assuming that our issue could be understood in terms of the unit of the district. Then, progressively, the search for an attachment to the district and its residents made the TB's approach become broader and less concrete, and brought with this the need for different skills and expertise. 'Bioclimatic urbanism' was in this sense already broader, and 'urban ecology' used by myself in later academic communications even more so – it became the frame for covering a range of potential issues. The process finally promoted for the Vinatea square did then not make any concrete references anymore to a 'bioclimatic' component. Along with the evolving configuration of our 'issue', the TB kept on searching for mobilization; at the same time, the process was throughout the process clearly attached to the neighborhood association. When the process focused finally on the design of the Vinatea square, this attitude was first maintained, until the process was at last handed over to the association. Also then the question moved between being a potential issue and a 'real' one brought forward by the association.

So we see that the TB wanted to work on an *issue* (or several ones) but experienced difficulties in finding *publics* mobilized or clustered around it. Two aspects show to be relevant in the decisions taken by the group in this respect: the question of 'size' (what is considered to be

'inside' and what 'outside' the issue) and the movement between defining the issue and exploring it:

-   With regard to the question of size, the process showed a progressive *downsizing* of the issue – from two rather comprehensive ones to finally one very concrete question. At the same time, for making sense, this small question was framed in the larger context of the district: it was not just the Vinatea square's design, but the complexity of the district, that gave the initiative a character of relevance. The unit of the district was determined in the very beginnings as the working unit at the same time as the problems and questions addressed certainly exceeded the district.[149] More so, we have seen that at the outset of the process, the TB addressed as a pilot project *two* issues, assuming that one would be a vehicle for addressing the other: during some time this did not seem to be the case, and only recently the experience is being adopted as a pilot project by the emerging science shop at the UPV.

-   The TB maneuvered between framing the issue (that is, defining it) and exploring it: the frame that the TB gave to the process responded to its capacities and interests, at the same time this frame was being adapted according to the exploration of the district. The definition conditioned the exploration and vice versa. The fact that the TB clearly pursued, at least in the beginning, its very own agenda may be understood as a constraint, as the TB rejected working on those issues where mobilization happened in the district. At the same time, the very sense of the process (as of any CBR process) was to work on problems where the TB would be able to contribute with its specific technical knowledge.

5.2.2. Articulation – a co-creation of knowledge and identities?

The evolution of the TB's approach to the **articulation** of these evolving potential issues is visible in the use of a particular notion used in the process: that of "sensibilization". The notion appeared in the first draft of the project, where one of our goals was defined as the "sensibilization of the population about the energy problem". Later, in the interpretative work following the SWOT analysis with the residents in our matrices, we used that word to describe those aspects that were important in our framework of bioclimatic urbanism, but not

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[149] For a discussion of the appropriateness of and the conditions for using the scale of the *district* for ecological urban planning see Hernandez Aja et al. (2009) and Alguacil Gómez (2000).

addressed by the participants of the workshop. In both moments, the notion transported an idea of awakening an interest within the district for aspects until that moment not taken into account but that could be brought to the district by some expert. While in the first use, the notion was part of our goals, in the second one those aspects that would need sensibilization were put aside – they were not excluded but not part of the immediate agenda anymore. Those aspects that we *included* were nevertheless not yet a door to the desired participatory dynamic that we were searching for. The following steps – that of the data gathering and analysis, as well as the last one of concentrating on the Vinatea square – show how the group wanted to make emerge through a more or less participatory inquiry those topics that were of possible relevance for the social and ecological quality of the district but that were unknown by then and whose nature was uncertain; and to make as well emerge an engagement with these topics, that is, people concerned by them and mobilized around them. In short, to produce issues and their publics simultaneously. This may still be called sensibilization, close to Peroni's (2006) outline of the notion's meaning in a pragmatist perspective. He points to the duality of the effort of sensibilizing (which resembles the duality of the articulation work as described in chapter two): to make something perceivable by the senses as well as make it enter the world of emotion or sentiment[150]; or said in other words, to make it part of the world of things and their articulation as well as of the world of concerns or meanings.

We see thus well the evolution of the exploratory character of the process that is in intention very much in line with the perspective of issue articulation. The TB did not get far in this - we have seen that the process stopped precisely when a concrete project came into sight for developing proposals in a participatory dynamic and in negotiation with the relevant actors, because the group was disintegrating; we have also seen that *the kind of technical knowledge available in the group in the end did maybe not support such a demanding agenda*. To sensibilize in this sense is a challenge of which much participatory research experience in urban planning gives account (aaa, 2007; Encina, Rosa and Caraballo, 2005). Literature documents here a creative list of instruments for "measurement" (making things perceivable and perceived) of that what is unknown; instruments of collaborative nature which often integrate artistic elements, relying on the peculiar capacity of art to create "de nouvelles manières de sentir et de penser à travers des formes capables de les rendre sensibles" (Sauvagnargues, 2002, quoted in Peroni, 2006).

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[150] In French, the verb "to sensibilize" ("sensibiliser") allows making this observation in a much more elegant way, as the verb relates both to the perception by the senses ("sens") and to emotions ("sentiment") (Peroni, 2006). The same works in Spanish: "sensibilizar" refers us to "sentidos" but also to "sentimientos".

In accordance to the evolution of the TB's approach, also the meaning of 'participation' was changing. In the beginning participation took the form of *consultation*. The confrontation of the TB's perspective with the residents' concerns was configured through the SWOT workshop and the posterior analysis as a one-sided activity: it was the TB who confronted the residents' concerns with its technical approach, in order to find points of contacts between the two. The crossing of the data in the matrices meant in fact to translate the residents' concerns to the TB's technical language of bioclimatic urbanism, and as any translation this was a matter of interpretation. This way, the residents had certainly influenced the TB's agenda. At the same time, a clear connection between both was still to be created. The second phase focused then on *communication* and again consultation, aiming at the engagement of the participants of the workshop and their appropriation of the work done by the TB. Finally, the process aimed at handing over the project to a group desiring to participate, that is, desiring to negotiate with the administration the design of the Vinatea square – finally the project was handed over to the neighborhood association who officially adopted the project but whose engagement is unsure. We have seen that the attachment of the process to the association's goals was in the beginning rather indirect, whereas in the end the goals of the process were principally conceived in terms of their usefulness for the association. Whereas in the beginning the TB had hoped for a wider mobilization and a critical learning, after a bit less than two years of work it hoped that the association would use its results in order to work for such mobilization.

So while the process aimed at a sort of issue articulation, it was confronted with uncertainties about what this would mean, in at least two respects: the difference between research and action, and the meaning of participation for 'critical research'.

- Concerning the difference between research and action[151], on the one hand, the TB's process had been defined as an applied research typical for engineering environments, directed to the generation of *solutions*. We sought later on to frame it as a kind of *action research*. As highlighted in the description, such a research perspective is necessarily a *non-linear* inquiry, guided instead by an exploratory spirit. In this exploration, the different steps done by the TB built on the foregoing steps (for instance, the matrices made the transition from the SWOT workshop to the diagnostic work; the conclusions and evaluations from the second workshop were supposed to feed the planning for following phase), but also responded tactically to new

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[151] In fact, the reader may have wondered how far the process described in this chapter actually deserves the label of 'research', as I did when asking myself for the meaning of the process for my PhD research.

circumstances. The activist character of the TB's process made the goal of systematic research often step back and made it pale in comparison to the action goal – especially in the last phase characterized by negotiations and the preparation of a participatory dynamic.

-   Second, we may ask how the *critical character* of the articulation effort can be realized when this effort is oriented to the generation of *solutions.* What can critical research mean in urban planning? On the one hand, a very practical goal as that of generating proposals for the district obliged the TB to be in close contact with the reality it worked on. The use of GIS software for analyzing and visualizing data about the district was here a approach for letting 'speak' the district – rendering accountable those aspects that were by then not 'participating' in the dialogue about the district's future. The practical goal of realistic proposals may be hence supportive of a broadening of the voices, that is, of an opening of the issue. On the other hand, in the generation of solutions *closures* are unavoidable: reductions take place, choices are made, and strategic action is taken – such as the TB started to do when initiating the negotiations about the Vinatea square. This stands in contrast to the understanding of issue articulation as an *opening* towards the integration of a diversity of actors (Marres, 2007). We have conceptualized the opening of the issue articulation in chapter two as a matter of confrontation. The TB's process has shown uncertainties about what it would mean in practice to produce a true confrontation of claims. When do 'opinions' and 'concerns' become knowledge claims? How to deal with those claims laden with politics? Should the TB have engaged with the mobilization around the parking issue or was it wise to prefer approaching the question under the very different frame of mobility? Does 'politicized conflict' impede working on knowledge questions or is it an opportunity for confrontation?

5.2.3. The identity question in the Taller de Barris

In general, the association was to be the point of entry to a wider dynamic of participation (that surely should benefit the association), related to the TB's own agenda. This own agenda made the TB almost appear a 'public' in itself. The **TB's identity** was throughout the process one of 'experts' offering their service on aspects they may be interested in and capable to work on. The TB configured itself as a group that would work on technical aspects and that would not engage into politicized dynamics, as those concerning the parking problems and those of prostitution and delinquency. The TB's identity had been conceived in the methodological

frame as an expert-driven approach with its *clear, own agenda*, at the same time as this should *be shaped* through the participatory approach. As we have seen above, this shaping was limited to the presentation and approval of the TB's work by the neighborhood association's board, and to the consideration of the feedback received in the workshops for the orientation of the process. It was neither materialized in mechanisms that would have established a kind of control over the TB's work by the 'participants' in the workshops (the workshop's results were interpreted unilaterally); nor did the TB respond to critiques coming from individual persons and uttered informally.

The relationship with university resulted to be informal throughout the process. The initial goal of being a pilot project for a science shop at the UPV stepped soon into the background although it was not entirely abandoned. The process became primarily an activist project. The engagement of UPV members happened mostly in an activist form, although later on both the architecture student and myself integrated the TB's work into our academic work. The only student that preferred considering his involvement in the process a strictly academic one (doing his final year project on a solar energy installation) had no more than loose contact with the TB's work and his contribution resulted to be inconsequential for the general process. Being an activist and informal process, the TB's functions did not include that of "protecting" the different parties. We have seen in the foregoing chapter that this function formed part of the self-understanding of the DTU Science Shop. There, the protection function was linked to its relative distance from the research process. In the case of the TB with its strong involvement in the process the task of protection was envisaged to be done through a contract establishing rules and responsibilities but was not concretized as such; it was substituted through a kind of oral contracts, that is, through agreements made from time to time with the association's board.

A particular challenge in the process appeared to be the establishment of *one* identity of the TB from the multiplicity of trajectories and interests coming together in the group. As typical for the constitution of an organization, the TB's identity was established by the documents that clarified its goals, by a common group dynamic, by its presentations in different forums and alike. Nevertheless, the TB stayed a heterogeneous ensemble until the very end of the process. The TB moved thus in an ambivalence between being multiple from within and being one actor from the outside[152]. Being one actor, it was thought to be a promoter and facilitator

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[152] This ambivalence is recognized in the perspective of issue articulation, as it describes the very nature of the mediator (Latour, 2005). I will discuss this point in more detail in the next chapter.

of a participatory process with the corresponding task of conquering and justifying its particular role towards the association –the association also being an entity with many heads. Looking back, the relationship between the two groups would have certainly benefitted from clearer arrangements and a stronger communication work. During the process, the question how to deal with conflict appeared to be more complex. The process has shown resistances to fixing the TB's identity, as this was constantly under exploration. Equally, it has shown resistances to having questioned its identity just from anybody. How far were the conflicts in which the TB was involved personal matters of some of its members, and how far did they concern the group's identity? To whom should the TB have opened its identity for critique in order to balance its position of power? What kind of confrontation would have been necessary and recommendable for this?

CONCLUSIONS

We have started the chapter with the reflection about the possibilities and impossibilities of evaluating the process promoted by the Taller de Barris. Throughout the chapter, I have offered an assessment of the process from the particular theoretical perspective adopted in this research. I have finally situated this assessment in the development of my position to the research process and its evaluation. This led me to discuss the uncertainties and ambiguities associated to the application of the perspective on the evaluation of community-based research. As a conclusion to the chapter, we may retain on the one hand the analytical interest of the perspective: the three dimensions of issue articulation allowed to develop a rich picture of the complexity of the process and of the decisions taken in it. The chapter has shown furthermore the potential of the perspective for evaluating science shop work 'from within', that is, not aiming at an external supposedly 'objective' judgment but at *learning* from the experience. The meaning of the perspective for evaluating community-based research would then be associated to an understanding of science shops as learning devices – or as devices for *experimentation* recalling the pragmatist spirit of issue articulation. It is this perspective on evaluation that I will explore in the next and final chapter of the thesis.

CHAPTER FIVE. EVALUATION FOR EXPERIMENTATION

INTRODUCTION

Along the different chapters of this thesis, I have developed a theoretical approach for understanding science shop work in new ways: an 'issue-centered' perspective based on a particular strand of pragmatist STS theory (Marres, 2007; Callon et al., 2009). I have discussed the potential of this approach for not only analyzing but also for *evaluating* science shop work. This last chapter will synthesize the results from this twofold discussion, making the step towards an 'operationalization' of the developed theoretical approach by offering a 'framework for evaluation' – a limited operationalization though, as the framework does not offer definite indicators for evaluation but rather suggests axes of *problematization* (Dewey, 2004; Callon, 1980; Foucault, 1994).

The path towards this framework was one of an analysis of science shop practice moving from a distant regard to a very attached one: starting with an general introduction of the DTU Science Shop as part of the science shop movement, getting closer through the study of the practice of this science shop from the perspective of an outsider, and arriving at my own practice as a kind of science shop practitioner. In this analysis, we have seen that the strong democracy perspective does not make justice to the observed practice. We have equally come to appreciate the analytic potential of the perspective of issue articulation, that is, for developing an understanding of science shop work in relation to issues about democracy. Yet, the discussion in chapter three has shown that this does not necessarily mean that we could 'use' the perspective for formulating outsider judgments on science shop work. It did not appear to be possible to judge the Vanløse collaboration with respect to its fulfillment of the exigencies of issue articulation - the very perspective of issue articulation problematizes the external evaluator judging the process according to the normative claim of the perspective, as its point of departure is an *experimental* perspective on democracy (Dewey, 1927; Marres, 2005, 2007). Chapter four has brought us a step further towards the comprehension of the kind of evaluation that this perspective might serve. The evaluation of the process of the Taller de Barris 'from within' showed a constructive potential of the dimensions of issue articulation

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just because of their inherent uncertainties and ambivalences that prohibit categorical judgments.

This chapter sets out to develop a framework based on this problematizing potential of the dimensions of issue articulation. This framework is not meant to serve as a tool for external 'objective' evaluation. It does certainly not deny the need for outside evaluation but is critical with those voices demanding an *objective* evaluation with *clearly defined criteria*[153]. This does not make it a relativist perspective: it does not reject the need for criteria nor their possibility. I will offer a framework that recognizes the need for criteria (and thus the need for operationalizing the theoretical perspective for evaluation, Rowe and Frewer, 2004), at the same time as it problematizes such criteria.

The framework is specific for science shop work. It relies on the more general framework developed by Callon et al. (2009) for participatory procedures in terms of its basic assumption: that the co-production of knowledge goes hand in hand with the co-production of identities, and that the effort of issue articulation needs to work in both dimensions. I will however not follow the distinction made by these authors between organizational and implementation criteria (Callon et al., 2009)[154]. This distinction separates the quality of the participatory procedure from the contestable identity of the participatory device, while my framework aims at capturing their interplay. The framework avoids equally the often made distinction between process and outcome (Rowe and Frewer, 2000): it is skeptical with the often made (exclusive) focus on 'impacts evaluation' in science shop literature (see for instance Hende and Jørgensen, 2001) but avoids equally prioritizing the process over the outcomes.

The structure of the chapter reflects the dual analysis made throughout the thesis in terms of the explanatory potential of the issue-centered perspective and its exploration as a perspective for evaluation. I will offer in a first part a synthesis of the theoretical perspective. For doing so, I will first discuss the perspective it seeks to dethrone and that I will name the 'strong democracy perspective' – not because it would truthfully reflect Benjamin Barber's corresponding concept (Barber, 1984) but because a good part of science shops' discourse relates this notion to a democratic argument that considers community groups to be representative of civil society concerns (see chapter one for a more detailed discussion). The discussion of the failures of this perspective to account for science shop practice will provide

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[153] Such an objective evaluation has been for instance demanded by Rowe and Frewer (2004). I will discuss this question later in detail.

[154] This distinction is similar to that made by Rowe and Frewer (2000) between acceptance and process criteria.

the basis for outlining an alternative perspective that I call an 'issue-centered perspective' on science shop work. Recalling the theoretical (pragmatist STS) fundaments discussed in chapter two, I will clarify their meaning for science shop work according to the three dimensions that have guided the analysis in the foregoing chapters: (1) the focus on **issues** and their publics, (2) the **articulation** of issues and publics, (3) the science shop's role as a **mediator** of this articulation.

In the second part of the chapter, I will develop the proper framework – making the step towards a more prescriptive stance, which the reader will note also in the very writing style, as I translate the theoretical discussion into a more 'practical' language. The framework is formalized as a series of *axes of problematization* of science shop work, which are established through a discussion of the interrelation of the different dimensions of issue articulation. These axes, elaborated on the basis of the results of the different chapters and gathered in a synthetic table at the end of the chapter, characterize the field of tensions in which science shop work moves. The framework sets with this the stage for conceiving science shop work as *experimentation* on these different aspects - or a constructive problematization of the very mission of the democratization of university R&D.

1. SCIENCE SHOP WORK IN THE LIGHT OF DEMOCRACY

1.1. Revisiting the 'strong democracy' perspective on science shop work: representation through intermediation

In order to appreciate the issue-centered perspective on science shop work, I will elaborate on the following pages a schematic outline of a contrasting democracy perspective that underlies, as I argue, certain ways of reasoning about science shop work in its contribution to democracy. This outline is certainly a caricature of certain aspects of science shop discourse. I offer this outline in order to follow the *logic of one often mobilized argument*, which is that of the representativity of community groups of 'civil society concerns': by supporting community groups, science shops support civil society concerns. I call this a 'strong democracy' perspective, because the concept of strong democracy has been mobilized in science shop discourse in this sense (see chapter one, 2.1). Yet, my discussion is certainly neither a critique of the concept of strong democracy as it was developed by Benjamin Barber (1984) nor a critique of Richard Sclove's interpretation of this concept (1995). The democratic argument of this perspective, as I would like to argue, is composed of the following aspects:

- A science shop supports the inclusion of *underrepresented 'concerns of civil society'* into university research;

- Community groups are assumed as being *representative* of these civil society concerns;

- This representativeness is assured by the *criteria of selection*;

- The science shop makes university research respond *directly to these concerns;*

- Consequently, the process of collaborative research is marked by a *strong attachment* to the community group's action goals;

- The science shop's role is that one of an *intermediary*, a catalyst that passes the concerns truthfully to the other side;

- Collaborative research can rely on the *'symbiotic relationship'* between the university and society.

A science shop supports the inclusion of *underrepresented 'concerns of civil society'* into university research:

The perspective starts from the diagnosis that "civil society concerns" (which may be referred to also as social and environmental concerns) are underrepresented in today's university R&D as they were in the Dutch universities in the 1970s. The kind of relationships with the outside world that characterize the R&D performance of the Technical University of Denmark (DTU) as well as that of the Universidad Politécnica de Valencia, are characterized by the progressive establishment of an entrepreneurial and business-oriented university model, in line with the worldwide trend of converting university into a site of 'academic capitalism' (Slaughter and Leslie, 1999). While the connection of universities to private business is well cared for and constantly expanded, the connection to community groups mobilized around social and environmental problems is not a priority and very poorly practiced. The "social interest" that university seeks to contribute to as part of its public mission (Danmarks Tekniske Universitet, 2006; Universidad Politécnica de Valencia, 2005) is in practice equated to the interests of the companies that it collaborates with, while there is no equal effort to connect with NGOs or other community groups which would often represent the "public interest" much better than companies.

Community groups are assumed as being *representative* of civil society concerns:

The perspective of strong democracy makes the step from this analysis (in its multiple variants) to providing the recipe for remediation, which seems to be simple: it consists in including the

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excluded. Their inclusion through collaborative research does not only counteract the underrepresentation of certain groups' interests in research and support this way their goals; it does also help to transform research and development practice itself, as well as university education. In this step towards inclusion, community groups are taken as the representation of 'civil society concerns'.

This representativeness is assured by the criteria of selection:

The criteria employed in the admission of requests serve for selecting those requests and groups that may be considered as underrepresented. It is desired and necessary to have a large number of these requests and to promote a large number of projects in response to them, in order to represent also an important diversity of underrepresented concerns.

The science shop makes university research respond *directly to these concerns:*

The community-based research (CBR) processes are initiated on the basis of incoming requests and it is the community group's concern contained in this request that should be responded to, in contrast to traditional research that 'exaggerates' the role of the expert. Although modifications and adaptations of the initial request coming from the community group are necessary in order to make a collaboration possible (focusing on the 'knowledge need' contained in the request and having in mind the needs and interests of students and researchers), it is a question of democratic relevance that the community group's concern is still represented in the final demand or project definition. To work with a 'demand-driven approach' constitutes then a fundamental principle of science shop work with democratic weight.

Consequently, the process of collaborative research is marked by a *strong attachment* to the community group's action goals:

The consequent strong attachment to the community group's action goals requires the collaborative research to be *useful* for the community group. To aim at such usefulness equals to the goal of making the research relevant for 'civil society concerns'. Usefulness becomes then democratically relevant. This seems to respond to a conception of science shop work that demands usefulness to be embedded into the entire set-up of CBR (Strand et al., 2003:xx). Already in the decision about the admission of a request, this goal is accounted for through the

criterion that the community group should be able to use the results. The goal is kept in mind throughout the whole CBR process until its end, where in the final meeting between the participants the uses of the project are discussed. The idea of usefulness also seems to be underlying the notion of 'empowerment' depicted by some as a principal goal of science shop CBR (Brodersen, Jørgensen and Hansen, 2006): research should serve for strengthening the weak; it should increase their resources for defending their concerns.

The science shop's role is that one of an *intermediary*, a catalyst that passes the concerns truthfully to the other side:

Science shop work is about promoting collaboration between different sides: the community group, represented by one or several persons on the one hand, and the students and/or researchers on the other. The science shop's role is perceived as that of an "intermediary" whose task consists in faithfully 'passing on' the concern of the community group and in making the connection between the two sides work. In this rather technical role, its position appears to be neutral, as becomes visible in several aspects. First, the science shop does not adopt the goals of the community groups as its own agenda, but makes others (researchers and/or students) collaborate with these groups for advancing their goals. Second, it does not examine the legitimacy of the community group's perspective on its issue apart from an initial evaluation of incoming requests. In fact, also in this initial evaluation it is not so much the Science Shop's staff but the selection criteria who judge such legitimacy - this perspective seems to become evident through the affirmation of the DTU Science Shop's coordinator that he and the rest of the staff do not judge the incoming requests morally [I1] (we will see later a different interpretation of this same affirmation). So if a group meets the criteria, no further evaluation of its relation to the issue is foreseen; a further moral judgment by the science shop would be inappropriate. This includes also that it does not inquire how far the community group's agenda is well represented through its members participating directly in the CBR process (we have seen this in chapter three) – the science shop does not mingle into the community group's internal politics. And third, the Science Shop's own politics appear under this perspective not to be part of the common agenda. The role of the intermediary of the science shop may be conceived in line with a form of professionalization where the politics of the institutionalization process are detached from the 'services' it provides to the different groups addressed.

Collaborative research can rely on the *'symbiotic relationship'* between the university and society:

To be an intermediary means to put into contact actors that fit together well once the connection is made. A science shop takes benefit from the synergies between the university functions of research, teaching and outreach, and of a "symbiotic relationship" between the university and civil society (Mulder et al., 2006:278). In this symbiosis, everyone gets what he or she needs: the students earn credits via their participation in the process; more so, they develop particular skills and competences typical for problem-based and real-life learning which will be useful for their future professional performance (Strand et al., 2003; Catlett and Beck, 2007). The community group invests precious leisure time and human resources but gets a useful report or similar result. The supervisor does at worst only his or her job and, at best, is rewarded by access and insights to real-life problems; he/she may also benefit from CBR projects in a wider sense if they relate to his/her field of specialization. And it is a symbiosis that can be made possible to the different participants without much costs – it is only the science shop's intermediation that is needed.

1.2. No guarantee of representativity, no intermediation!

The critical point of this perspective is that it considers the community groups to be representative of 'civil society concerns', in case they meet the selection criteria. This is based upon two assumptions: first, that community groups can be representative of civil society concerns; second, that an objective judgment on this representativity can be guaranteed through the criteria. We have seen in chapter two that both assumptions are problematic. They require the identification of an abstract 'public interest' as a basis for the evaluation of the requests of community groups. In contrast, the requests of the community groups participating in the CBR processes analyzed in this thesis have shown to resist any easy classification in terms of a public interest (as discussed in chapter two): it cannot be sustained, for instance, that the community group participating in the Vanløse collaboration represents 'the public interest' – the group is also defending its 'private' interests when participating in local urban planning, and belongs in fact to a rather privileged segment of the population, (as a federation of homeowners' associations in one of Copenhagen's villa quarters). At the same time their action is indeed directed at promoting concerns of wider social and environmental interests, so that their request cannot be classified as purely private. Also the neighborhood association El Palleter of Velluters is not necessarily identified with carrying a 'public interest' but can neither be reduced to a 'private interest'. The point here is not that these groups

would not carry such a public interest – the point is that it as difficult for us, as analysts, as it is for the corresponding science shops to decide whether this is the case. At closer look, the apparently "clear sides" reveal themselves to be very unclear, so that taking the community groups as being representative of the public interest becomes problematic. We have seen in the case of the DTU Science Shop that in the light of such a lack of clarity, the judgment over the representativity of requests and community groups cannot be delegated to the criteria alone; instead, an important interpretative work needs to be done. It becomes clear, then, that a science shop is anything but neutral.

Representation is a problem: it cannot be taken for granted, as a quality of certain groups or individuals; it rather emerges from the work of these groups to establish those representational chains that justify their position as spokespersons of their collective[155]. This also is the case within the community groups: the representation of the community groups' agenda through the persons participating directly in a science shop project is not that unambiguous neither. In fact, in the Vanløse process, it was not totally clear whether "the three guys" would actually represent the Vanløse Federation of Homeowners' Associations or the Local Council – they acted on behalf of the first, but the results were used by the second. This was partly due to the fact that the three persons directly involved in the CBR process were members of both groups, but also to the changing nature of these organizations – when the first demand was discussed for the Science Shop's catalogue, the Local Council did not yet exist as such and just took form in the years afterwards. Moreover, both organizations are heterogeneous groups. They are so even more obviously than other community groups, as for instance the very idea of the Local Council is built on comprising a large number of representatives of different local associations and local political parties. The general feature of heterogeneity present within any community group poses the same difficulties as those outlined above when the claim for representativeness is raised, that is, when we ask what interests does the project actually respond to – those of the particular persons or those of the community group?

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[155] That representativity is the result of representational work and accordingly of unstable nature is an important argument of early writings by authors of the sociology of translation/actor-network theory. It has been developed for instance by Michel Callon in his article about a controversy concerning the causes for the decline in the population of scallops in a French costal region and the attempts by three marine biologists to develop a conservation strategy for that population (Callon, 1986). Callon shows here different steps in this representational work as carried out by these scientists (problematisation, interessement, enrolment and mobilization) through which they managed to build up the mentioned representational chains that sustain and justify their position in this particular network.

As a consequence of these problems of representation, the strong attachment of the research process to the community group becomes problematic. The difference between what is considered applied research and science shop CBR becomes less clear-cut: the action-orientation of science shop CBR may produce an instrumentalization of university research. The critical character of research, which under this perspective is assured by its independence from particular interests, cannot be brought into coherence with a strong attachment when the argument of representativeness does not apply anymore: the strong democracy perspective makes the goal of an 'independent' and 'participatory' research - which are distinctive features of science shop work (see chapter one) - an oxymoron.

The quest for representativeness produces then for a science shop a tension between critical research and the attachment to the community group – a 'tension' because both seem to be needed and they are impossible to combine: compromises have therefore to be found. In light of this tension, the symbiotic relationship between the university and society becomes less clear. As a consequence, a science shop may need to do more than just play the role of a neutral intermediary between the different groups in order to attain its goal of democratization – as the DTU Science Shop did in the two cases analyzed in this research and does in general. The DTU Science Shop *wants to be* more than just an intermediary that is faithful to the goals of the community group, as it pursues its own goals.

These weaknesses of the strong democracy perspective bring to the fore the explanatory potential of the issue-centered perspective. It enables us to recognize the problems of representation and integrates them into the very heart of its democratic argument – as the same time as this very 'democratic argument' becomes a problem to be explored. This is what I will discuss in the next section and the remainder of the chapter.

1.3. An issue-centered democracy perspective

The issue-centered perspective developed here can be characterized as a pragmatist perspective located between STS and political philosophy. The outline of this perspective on the following pages relies on the discussion given throughout the previous chapters. It is my proposal for an interpretation of science shop work in terms of democracy. I argue that the observed science shop practice may be understood in terms of the democracy perspective outlined by Marres (2005; 2007) in her actualization of the Lippmann–Dewey debate and of the closely related perspective of 'technical democracy' as discussed by Callon et al. (2009). Following this perspective, the democratic logic underpinning science shop work is that of the

articulation of issues. This logic, that would define what we may call an 'issue-centered science shop', can be summarized as consisting of the following elements:

- The focus does not lie on an abstract 'public interest' but on *issues* and *publics* concerned by these issues;

- The collaborative research aims at the *exploration* of the issue and its publics through the confrontation of claims;

- The science shop's role is that of a *positioned mediator;*

- As such, it promotes the engagement of the university in the exploration of issues and a simultaneous exploration of the role of the university in society.

The following outline of this perspective is, again, rather schematic. The basic ideas are presented and a logic argumentation is built, leaving a more detailed discussion of basic concepts to the second part of the chapter.

Before developing my argument in detail, I would like to point out that this democracy perspective may appear to be very exigent, or even too much so. However, its democratic claim may be considered a challenge rather than an impossible ideal to achieve, understanding that democracy "constitutes both a fixed horizon and a never-completed undertaking" (Callon et al., 2009:238)[156].

1.3.1. Issues and publics instead of an abstract 'public interest'

The basic difference of the issue-centered perspective to that of strong democracy is the way the question of representation is dealt with. Instead of assuming an unproblematic representativity of the community groups and their requests in terms of a kind of 'public interest' (which does not withstand closer analysis), this representativity is recognized as a problem that a science shop needs to cope with. This way, the question of representation ceases to be an impasse and becomes an opportunity for exploration. Under an issue-centered perspective, one would be rather skeptical with abstract concepts such as the 'public interest' (or 'civil society concerns'). Instead, one would focus on the way how such a public interest emerges from very real *'publics'* gathered around *issues*; that is to say, publics that gather around problems that they are affected by and for which they claim a better settlement, defining them accordingly as (public) issues. These concrete publics are much easier to localize

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[156] Similar perspectives on democracy have been expressed by Chantal Mouffe (2000).

than the abstract public interest – and the two are not to be confounded. At the side of one 'public', there may be many others with other claims about the issue in question. The question whether the claims of such a group are 'public' or 'private' is impossible to answer as such – and this is so because the private and the public are not oppositions (as I have discussed in chapter two). The public is potentially contained within the private, it is the everyday experience with its passions and concerns that motivates the emergence of groups around the issues that produce those affections (Callon and Rabeharisoa, 2008; Feenberg, 1999[157]). It is a very direct experience of the overflows of techno-scientific development (Callon, 1998a) that motivates for engagement, for demanding a different settlement of the issue by the institutions[158].

Science shop work may be then conceived as engaging with such publics for a collaborative exploration of their issues. However, issues are moments of uncertainty – they become opportunities for 'democratizing democracy' not because they would necessarily lead to the settlement of the problem as claimed for by its publics but because they induce dynamics of *exploration.* For a science shop, to engage with issues and publics means to engage with the uncertainty about the nature of the questions involved: it means to be interested in the complexity of entanglements of things, people, values and interests that in a certain moment shows existing knowledge and socio-technical configurations to be insufficient. When the science shop responds to a particular group that, on the basis of its affections or concerns, claims for the need for a different handling of the issue, it engages in the wider debate on how this could be done. It participates hereby in the articulation of the issue: in the construction of *knowledge* and *identities* that start filling the void, that start giving responses to the challenges that the issue poses.

1.3.2. Collaborative research as issue articulation

Choosing to collaborate with concrete 'publics' means to engage with a particular and situated perspective on the issue - one perspective among others. If the science shop's engagement wants to be understood as a contribution to democracy, it cannot stick just to this one group,

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[157] This kind of mobilization has been described by Callon and Rabeharisoa (2008) under the notion of 'concerned groups', based on an analysis of the French association of patients suffering from muscular dystrophies. Also Feenberg's (1999) notion of 'participant interests' wants to address such a kind of mobilization that does not obey a logic of ideological affinity or of social groups but results from shared affections caused by a technological or scientific development.

[158] We see that this perspective does not ask for abandoning 'delegative' democracy but to improve it, that is, to 'democratize democracy' (Callon et al., 2009:225ff).

the 'one public' concerned by the issue. The *democratic effort* consists in exploring the different claims uttered by different groups around the issue in question: to explore the joint and antagonistic actors gathered around it (Marres, 2007) and to inquire their representativity, participating in the work of representation "that is constantly taken up and started again" (Callon et al, 2009:116). In other words, the democratic effort does not lie in supporting the community group but in supporting the process of building up a 'research collective' (Callon et al, 2009).

When the attachment of the research to the community group's goals ceases to be unconditional, *conflict* becomes a central concern of the CBR process. The very meaning of conflict for the process changes: from being an undesired ingredient in the strong democracy model (that suggests a symbiotic relationship) it becomes an opportunity[159]. An opportunity for exploring the issue in its complexity, as the abounding literature on the value of controversy for understanding techno-scientific development shows (see section 2.2.1); an opportunity for exploring the public claims on the issue in question, as the different actors make their joint and antagonistic involvements explicit. Conflicts or controversies are opportunities for opening issues for critical scrutiny (Marres, 2007; Rip, 1986; Lascoumes, 2001). Disagreement and debate produce an evaluation of the different perspectives in play in a collaborative undertaking. There is no universal 'objective' judgment possible whether one particular concern uttered by one specific actor is of significance. In contrast, this nevertheless important judgment cannot result but from debate between the different actors involved, *including the issue itself* which may show resistance to its representations mobilized in the arguments – producing what Latour (1996) calls "inter-objectivity". In this sense, "expertise" emerges from concrete situations of trials and is certainly not a quality that some of the participants possess[160].

The relationship between researchers and community groups is then a critical one. They share during the CBR process the interest for exploring the issue in question and they recognize each other as counterparts in this process. The CBR process is therewith necessarily less action-oriented than in the other model. Although the process seeks an attachment to a particular

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[159] The particular emphasis on the role of *conflict* in CBR contained in the issue-centered perspectives resonates with Low's account of the role of 'dissent' for CBR at universities (Low, 2008).

[160] The issue-centered perspective would be thus critical with certain propositions to classify different sorts of expertise, such as suggested by Collins and Evans in their controversial proposal of a 'third wave of science studies' (Collins and Evans, 2002). Their position has been critically discussed by Wynne (2003), Jasanoff (2003) and Rip (2003) for not accounting for the 'constructed' nature of expertise.

group (or several ones), this attachment is subordinated to the goal of producing critical research, understood as the exploration of the issue with its possible multiple "publics". As a consequence, the goal of producing *independent and participatory research* ceases to be an oxymoron, as independency does not need to mean the absence of attachments (Callon, 1999) and as participation may mean confrontation and certainly not an unconditional attachment (Elam and Bertilsson, 2003)[161].

However, in the light of existing asymmetries in research, such an emphasis on the critical and confrontational character of CBR may easily reinforce the role of the researcher as 'the expert'. The collaborative exploration of knowledge and identities may easily turn to those patterns of knowledge production that CBR is supposed to counteract. This is the particular task of the science shop: to watch over the *appropriate* critical and confrontational character of the CBR processes it facilitates. Such a task may be considered a field of expertise on its own, as Callon et al. (2009:162) suggest:

> "To remedy these asymmetries it may be useful to envisage the formation of new professional roles: translators, mediators, facilitators of debates and negotiations, and political organizers whose explicit task would be to make it easier for previously excluded actors to enter the public space."

But the science shop is in this, as any other actor, a *positioned actor*, and his position as a 'mediator' certainly not unproblematic, as I will discuss in the next section.

1.3.3. The science shop's role as a positioned mediator

The science shop is not a mere, somewhat neutral, intermediary but necessarily involved and interested: it is the promoter of a collaborative exploration that would not take place without its mediation; and it does not want to promote just any kind of collaboration but a critical exploration of the issue. We should therefore call it a *mediator* (Latour, 2005, Hennion, 2007), a term which does more justice to this involvement and interest, as we have seen in chapter two.

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[161] The issue-centered perspective is in this respect in line with such perspectives that make a distinction between *participation* and *democracy*: the opening of actors (diversity of points of view) is not a guarantee of good results (Lopez Cerezo, 2007, Grunwald, 2004). It invites thus to revisit the possible contribution of science shops to the critical character of university research. This critical character has been pointed to for instance by Fischer et al. (2004:209) who suggested that science shops could be a means for universities to "partially reclaim their critical function by making themselves relevant to their city, their region, citizens, environmental groups, trade-unions, etc."

When promoting the exploration of issues, the science shop explores at the same time how to make university researchers, students, and others participate in this effort. By promoting collaborative research, it thus investigates simultaneously its very own project of promoting a critical role of the university in society. The step from "talking the talk" to "walking the walk"[162] is not at all easy: the science shop has to translate its normative desire of rectifying asymmetries into a 'participatory mechanism' with appropriate goals, structures, capacities, etc. This can however be only imperfect and criticizable; also this is a problem, an issue, laden with uncertainties and a diversity of claims of a variety of actors.

As the issue-centered science shop cannot find anymore legitimacy through the representativeness of the community groups of the 'public interest' assured by the selection criteria, it assumes the responsibility of choosing the actors and designing its particular experimentation – it does so as an engaged actor itself, a positioned actor. The 'politics of positioning' (de Laet, 2002) oblige the science shop to *conquer and justify* its role towards a diversity of actors; among them its sponsors and the participants in its CBR processes, but also towards those who show to be affected by its actions (Rowe and Frewer, 2004). The success will depend on how far its efforts in doing so are valued as a contribution to the investigation about the role of the university in society.

The opposition of the issue-centered perspective to that characterized under the label of strong democracy may be summarized as follows:

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[162] As some science shop practitioners describe their task, as we have cited already in chapter one Mulder et al., 2006.

Strong democracy perspective	Issue-centered perspective
The science shop responds to the needs directly expressed by community groups.	The science shop promotes collaborative research with publics mobilized around issues.
Democratic argument: the representativity of the community groups of civil society, assured by the selection criteria.	Democratic argument: the articulation of a diversity of actors through the confrontation of claims towards a public-ization of the issue.
The science shop: an intermediary… - guaranteeing the truthful attachment to the action goals of the community groups; - relying on the symbiotic relationship of university and society.	The science shop: a mediator… - responsible of the articulation; - pursuing an own interest.
A *clear alternative vision* for the role of university of society.	*Uncertainties* about the role of university in society.

Table 5.1. The strong democracy perspective versus the issue-centered democracy perspective

We have seen throughout the thesis the analytical significance of this issue-centered perspective: it explains science shop work better than a strong democracy perspective. The remainder of this chapter deals with the operationalization of this analytical perspective into a 'tool' for evaluation. This undertaking is not free of tensions, as I will discuss in the following lines.

2. A FRAMEWORK FOR EVALUATION: ISSUES, ARTICULATION AND MEDIATION

The operationalization of the theoretical perspective of issue articulation into a *framework* wants to make the theoretical discussion made by now relevant for science shop practice – for practitioners and other actors engaged in some way or another in this practice. This supposes to make a step from a rather analytical regard to a prescriptive one; a step that carries with it a change in the writing style. The style may appear at times slogan-like, as a result of the

translation of the discussions in each section into summarizing phrases that conclude each. This allows to compose the framework as a 'concentrate' of the more complex discussion.

The form of operationalization adopted here understands evaluation as an integral part of collective experimentation. In this respect, it emphasizes the situated character of the way how sense is and may be made out of science shop work in light of the proposed theoretical perspective.

Gene Rowe and Lynn Frewer have defined operationalization as "the development of instruments or processes that enable the measurement of successful attainment of the effectiveness criteria" of a procedure (Rowe and Frewer, 2004:521). However, to develop operational measurement instruments means to decide first what criteria may define the 'effectiveness' or quality[163] of a procedure. This is a complex undertaking, as effectiveness is not "an obvious, unidimensional and objective quality (…) that can be easily identified, described, and then measured" (ibidem)[164]. The very definition of quality is at stake in participatory procedures, and differs according to the various constituencies involved in them, "from the sponsors to the participants and the various publics (or stakeholder groups) that they are meant to represent. Hence, what might appear effective to some might not appear so to others" (ibidem, pp.519,520).

This complicates any development of precise instruments or processes. Universal criteria appear impossible to be achieved, at the same time as their rejection in defense of a situated definition of any criteria appears to be a relativist position. In light of this dilemma, the approach suggested by Rowe and Frewer is to balance between the extremes of universal and situated criteria:

> "There is no correct answer to the universal-versus-local question. However, we suggest that specific aims of individual participation exercises may always be phrased in terms of more general classes of aims (though whether the classes are broad enough to be described as universal, or less broad and hence local is open to debate) that will allow comparative analysis. This is not to say that researchers should accept a single universal definition, or a single set of local definitions that are independent and mutually exclusive (…) but simply that a more general phrasing of what is meant by effectiveness is necessary if we are to acquire findings that are comparable." (Rowe and Frewer, 2004:519)

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[163] The authors refer in general to the 'effectiveness' of a procedure, considering this notion equivalent to that of 'quality' (p.517).

[164] In other parts of their paper, the authors seem finally to opt for assuming an objective stance as possible.

This discussion shows an important tension which attempts for evaluation face and which needs to be confronted in this framework. Generalization shows to be a necessary goal if we want to discuss the meaning of science shop work beyond particular cases, yet, at the same time, any such generalization cannot be but contested in the light of concrete science shop practice[165]. To translate the issue-centered perspective into clear criteria or indicators is an enterprise that would hardly do justice to the uncertainties involved in a (normative) application of the perspective that we have seen in chapters three and four. Accordingly, the particular form of operationalization chosen here consists in establishing a list of challenges that have become visible in the observed science shop practice; this provides a frame for engaging in a situated form in the development of concrete criteria and indicators. It is in this sense in line with approaches to evaluation that suggest the co-construction of the very evaluation method by those involved (e.g., Syme and Sadler, 1994).

The proposed framework is the result of my analysis of science shop practice according to the theoretical perspective described above, as well as of the analysis of the perspective's normative claims on the basis of the observed science shop practice. The very framework is conceived as a proposal of taking further this dynamic of mutual sense making by bringing into resonance practice and theory: to assume science shop practice as a field of trials in order to prove and contest the normative (and rather abstract) claims of the theoretical perspective and thereby develop it further.

In the remainder of this chapter, I will develop this framework according to three central dimensions of our theoretical perspective: issues and their publics, articulation, and mediation. I will discuss the observed science shop practice in light of these dimensions and their interrelatedness. This will lead me to establishing nine 'axes of problematization', to be taken as the basis for an experimental understanding of science shop practice. These will be summarized at the end of the chapter.

This discussion is structured according to three blocks where I will discuss the triadic relationship of the dimensions (figure 5.1). I will start with the question what it means for a science shop to engage with issues and publics. I will focus thereafter on the implications of the goal to promote their articulation through collaborative research. I will conclude with the implications of the foregoing aspects for the science shop's role as a mediator.

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[165] This seems to be particularly important considering the diversity of 'science shops' described in chapter one.
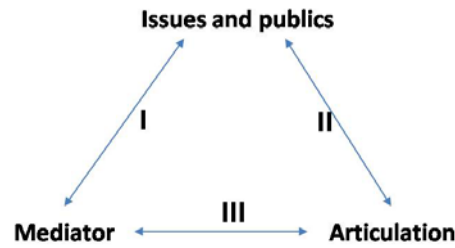
Figure 5.1. The three dimensions of science shop work as issue articulation.

2.1. Principles for evaluation

Before entering the discussion of the dimensions of the evaluation triangle, I would like to make some cautionary preliminary remarks concerning the understanding and employment of the proposed framework, establishing a number of principles for its 'use':

Exigency as challenge

Constructive evaluation

A framework for thinking yourself

Figure 5.2. Principles for the 'use' of the evaluation framework.

Exigency as challenge

As I noted earlier for the theoretical perspective of issue articulation, although this framework is highly demanding, it should certainly not be rejected because of this exigency. Although this perspective does certainly not suggest a take-it-easy attitude, as a pragmatist perspective it does not only acknowledge that problems and failures are inherent to CBR but it encourages taking them seriously as opportunities for exploration. The more ambitious the goals of a participatory procedure, the more it challenges the conventional way of doing (Callon et al., 2009:161) and the more demanding it is. The lower the resources available, the lower will be the achievement – but low resources spur equally innovative responses. This framework is not meant to discourage science shop work but rather offers a means for measuring the challenge.

Be constructive

One result and concern of this thesis has been the situated character of evaluation. Evaluation depends on who evaluates and its relation to the experience to be evaluated. It depends on

the moment of evaluation, as things look different when looking back or when being in the process to be evaluated. It depends on the aim pursued, be it learning or judging or something in between the two.

We have seen in chapters three and four that the perspective serves badly for judging science shop work, even from within. The temptation is strong to do so, even when having been involved in the experience personally (as was my case in the process of the Taller de Barris). It is however more interesting to employ the problematizing potential of these dimensions for understanding the *decisions* taken during a process in order to learn about and demonstrate the complexity of science shop work.

<u>Use the framework for thinking yourself</u>

Last but not least, in developing this framework as well as when employing it, the dimensions of the perspective need to be 'reified': the issue, the articulation, the mediator need to be fixed in concrete categories. *Doing* science shop work or *understanding* this practice means to balance between fixing categories and questioning them.

While seeking theoretical coherence, developing a logic argument and even operationalizing it to a certain degree into a 'tool' for evaluation, this framework does not relieve from thinking oneself. In fact, the perspective wants to encourage people to become knowledgeable about the theoretical discussions on the different challenges involved in science shop work, as the framework's interest increases the more one understands its background. It encourages science shop practitioners to create theory themselves.

So, after this restriction of what this framework wants to be and may be, we can enter now the discussion of its particular dimensions.

2.2. Engaging with issues and publics

When a science shop engages with issues and publics, at least three aspects appear to be challenging: to identify and define what may count as issues and publics; the particular movement between a demand-driven and a proactive work for getting 'access' to such issue-publics dynamics; and the role that the selection criteria fulfill in this respect.

2.2.1. Defining what counts as 'issues'

When a science shop engages with issues, it engages with controversy. This means that it engages with situations where knowledge and politics are profoundly intertwined; situations

that require and encourage exploration and learning (Callon et al., 2009:28-34). Controversies have been widely appreciated as opportunities for *analyzing* the uncertainties and complexities of science and technology (Latour, 1989, Callon, 1981, Barthe and Linhardt, 2009, Barry, 2001, Meyer, 2009)[166], as well as for *giving account* of the distributed character of knowledge production in form of 'hybrid forums' (Callon and Rip, 1991, Callon et al., 2009) or 'scientific citizenship' (Elam and Bertilsson, 2003)[167]. They are furthermore being employed and explored as a pedagogical means, that is, for making students and practitioners *learn to analyze* science and technology (Martín Gordillo and Osorio, 2003; Muniesa, Luque, Chinchilla, and Jaque, 2005; Chinchilla and Muniesa, 2005; Steinhaus, Heesterbeek and Aparicio, 2008[168]; Venturini, 2009; Schlierf, 2009). Taking controversies *as occasions for community-based research,* a science shop that follows an issue-centered approach combines such an analytical (and possibly pedagogical) interest in controversies with an interest in engaging in (collaborative) action on them*.*

This interest in controversies as opportunities for promoting public participation in science and technology is certainly shared with other participatory devices. Constructive technology assessment (Rip, Misa and Schot, 1995; discussed in some detail in chapter one) or consensus conferences (Joss and Duran, 1995) usually deal with large scale controversies on conflictive issues such as genetically modified organisms (Einsiedel, Jelsøe, and Breck, 2001), telecommunications (Guston, 1999), or nanotechnologies (Powell and Kleinman, 2008; Laurent, 2009; Rip, 2007). The National Commission for Public Debate in France (Commission Nationale de Débat Public) organizes debates on planning or infrastructure projects with larger impact on environmental or land-use issues[169].

We would then ask for the particular kind of 'public engagement' that an issue-centered science shop may envisage and enact. Different participatory devices are based on different

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[166] Revealing the politics contained in apparently scientific or technical questions as well as the technoscience contained in politics (Barry, 2001), the analysis of controversies allows partially reconstructing the chains created between the politics of knowledge or design and policy making (see chapter one).

[167] Similar notions are that of 'citizen science' (Irwin, 1995) or the 'active scientific citizen' (Barry, 2000).

[168] The European project CIPAST aimed at collecting and disseminating useful practices and sharing this way the experience of public participation initiatives. This has been translated into the development of elementary sets for teaching and learning, based on 'real life case studies', that can be used and re-assembled by potential users. The document provides equally information resources about designing participatory procedures, experts, literature and additional experiences.

[169] An overview and discussion of this institution can be found for instance in Blatrix, C., Blondiaux, L., Fourniau, J.-M., Hériard Dubreuil, B., Lefebvre, R., & Revel, M. (2007).

conceptions of 'the public' that should (be) engage(d), the framing of the problems to be dealt with, as well as the uses of the results (Laurent, 2009; Fourniau, 2008; Irwin, 2001). For instance, much consensus conference designs explicitly search for citizens that do not count with any particular attachment to the issue discussed (Fourniau, 2008). This way, it is assumed that the participants can be taken as (at least approximate) representatives of a sort of 'general interest'. Such a design creates a demarcation of a kind of 'ordinary citizen' from an involved one, invoking an opposition of the private and the public interest (ibidem). In contrast, an issue-centered science shop takes personal attachments as the ground for working on the public interest, as I have argued earlier. This kind of citizen can be considered close to the 'amateur' citizen that some describe to be invoked by the French National Commission for Public Debate, that is, *a concerned citizen* (for instance, a resident affected by a planning project) that "values the general interest, shows interest for its construction and for participating in this construction on the basis of his or her own preoccupations" (ibidem, p.23).

In addition, an issue-centered science shop calls for such citizens that *take action for advancing research on behalf of their concerns*. In the literature about 'concerned groups' (e.g., Callon and Rabeharisoa, 2008), groups with this characteristic have been exhaustively studied. As a participatory device, an issue-centered science shop suggests that such groups cannot only be studied, but also be engaged: that the science shop can work with such groups on the basis of their very concerns towards the 'public-ization' of the issues at stake. The chapter about the Taller de Barris has shown particularly well that it may be difficult to put this into practice. Working with *possibly emerging* groups and issues, the Taller de Barris members had a hard time to judge how to promote a possible 'public' potential, and to do so through research. Confronted with this uncertainty, the Taller de Barris was constantly exploring and defining what may count as such concerns and mobilizations that would fit into its participatory project. Also in the DTU Science Shop's project, we could appreciate this constant work of exploration and definition.

We may conclude then that by promoting participation in line with this particular idea of citizenship, an issue-centered science shop participates in the **exploration and the definition of what may and should be understood in the promotion of collaborative research as 'issues', 'publics', and as 'concerns' or attachments that link both.** It participates in the assemblage of a particular vision of 'scientific citizenship', that may participate in the democratization of science and technology.

2.2.2. Getting to the issues and their publics through both a demand-driven and a proactive approach

Having discussed the issue-centered science shop's particular interest in small issues, we may consider now the means it employs for *accessing* them. I have suggested in chapter one that science shops can be characterized as offering an invited space for claimed participation; the science shop moves here between a passive offer (following a demand-driven approach) and active configuration (being proactive).

General science shop discourse emphasizes the demand-driven approach as a basic working principle. Science shops open the doors of the university and hope that publics come with their issues. They hope that these publics do not only recognize the potential contribution of university researchers and students for advancing their claims, but also that these publics consider this contribution worth the effort they need to invest in such an undertaking. Under the strong democracy perspective, the demand-driven approach is a normative principle: it *should be the very community group* that frames the issues in order to approach the collaborative research to an idea of direct democracy.

In contrast, we have seen throughout this thesis (1) that science shop practice is far more complex than a normative understanding of the demand-driven approach would allow; and that (2) its value as an exclusive normative principle is questionable.

- Concerning the first point, even when supposedly working on a demand-driven basis, the limits towards a *proactive* handling of the framing of problems are blurred, as we have seen in a number of examples of the DTU Science Shop in chapter two (for instance in the broad demands put into the catalogue by the association KMEK in order to attract students to be creative on their behalf). More so, on occasions the DTU Science Shop explicitly adopts a proactive approach in order to address 'orphan issues' that no community group brings forward.

- Concerning the second point, we might think that the demand-driven approach responds to a general claim made in literature on participation in science and technology for introducing participation '*early*' in the research and/or technology development process (Schot and Rip, 1997; Lengwiler, 2008). The movement between the demand-driven approach and a proactive one shows how a science shop is possibly torn between two rather different and competing definitions of that earliness. On the one hand, we may say 'early in the research process': following the demand-driven approach, we would then start the framing with the publics themselves. On the

other hand, we may say 'early in the issue's configuration': following a proactive approach, research may start before there may be publics for the issue. For instance it may aim at producing issues and publics simultaneously, according to an approach of *sensibilization* as characterized in chapter four.

To get 'access' to the issue-public dynamic is a matter of *shaping* this very dynamic in order to give it a manageable character. Issues and publics are inherently intangible and unstable matters. The reason for this is that they are mutually defining each other: on the one hand, "issues call publics into being" (Marres, 2005:47), so that the issue appears to be the starting point for issue-publics dynamics; on the other hand, issues are defined by the very existence of publics and their claims (although they cannot be reduced to 'framing processes' between different social groups, see Marres, 2007:772)[170]. In the light of such fluidity (Mol and Law, 1994; de Laet and Mol, 2000), we could say that when following a rather demand-driven approach, a certain public is fixed through the reduction of complex and heterogeneous identities and thus made available for advancing towards an issue. In contrast, when following a proactive approach, this reduction concerns the issue, whose definition is the first step for assembling possible publics.

Moving between both approaches, a science shop explores how to initiate CBR processes that concern issues and deal with publics. It engages hence in the **exploration and definition of the ways for engaging with issue-publics in spite of their intangibility and instability, between a demand-driven and a proactive approach.**

It is furthermore confronted with the challenge of selecting those issues and publics it wants to engage with, as we will see in the next section.

2.2.3. Selecting 'good' issues and publics

Are some issues *more relevant* than others? For instance those brought forward by 'socially deprived groups' (Wachelder, 2003:262,267)? Are some issues *better* than others, some publics better counterparts? In this section we will be interested in the role of the criteria of selection in an issue-centered science shop.

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[170] The notion of 'framing' has been often employed to discuss the maneuvering of actors with respect to meanings, values, ideas, etc. (Goffman, 1974; Benford and Snow, 2000; Entman, 1993), which resonates with 'social constructivist' perspectives in science and technology studies. In contrast, the here adopted approach claims to go beyond the social-object divide in the discussion of framing processes (Marres, 2007:772), in line with the approach of actor-network theory (Akrich et al., 2006).

We have seen earlier that the DTU Science Shop rejects the idea of a moral judgment of the incoming requests. To reject such a moral judgment does however not mean that the DTU Science Shop rejects the idea of judgment in its totality: it certainly *selects* among the incoming requests with the help of the criteria. In its qualification work, described in detail in chapter two, we have seen that this selection asks for the public potential of the request and for its knowledge need. It asks thus for the congruence of the request with its particular mission: promoting the public potential of issues through research. It searches to make the community group's issue fit its own issue, which is that of transforming university research and teaching (see section 2.4.2).

The three criteria play an important role in this selection. We have seen earlier that this role cannot consist in guaranteeing the representativity of the community groups, as the strong democracy perspective may make us believe. We have also seen that this is not the function the DTU Science Shop assigns to the criteria. In contrast, in accordance with the observations made on the qualification work of the DTU Science Shop, the criteria appear to serve for transporting a normative claim at the same time as there are of instrumental value. Let's examine this double function in detail with respect to the three criteria:

- The criterion of not disposing of the resources necessary for accessing university research aims at selecting those groups usually excluded from university research. In its application, a science shop defines those that are excluded and that should consequently be included. At the side of this claiming function, an instrumental value of this criterion may be that it makes the science shop choose concerns and perspectives that are likely to be *different* from those already present in university research – being different is thus an important ingredient to the critical collaborative research it wants to promote (see section 2.3.2).

- The criterion that the community group should be able to use the results for advancing its mission responds to the normative claim that university research should be socially relevant. In practice, this criterion is often interpreted as a need for a community group that would count with a certain strength and stability for making such use of the results (Mulder et al., 2006). It may help then equally to select such counterparts that would have the necessary *strength for engaging in a collaborative inquiry on their issue*.

- The non-commercial character of the request corresponds to the normative claim that (a public) university should serve non-profit interests. Instrumentally, it may be a way of selecting counterparts that would be willing and interested in engaging in identity work: in exploring their own identity while exploring the issue[171].

The criteria may serve therefore for searching for '*different*' issues, and for *'strong counterparts'* with an *interest in exploring the public dimension* of their problem and for doing so by systematic *research*. The selection according to these or other criteria[172] is however in any case a work of interpretation: at the same time as the criteria help in the selection, they need to be interpreted. By making some of these criteria explicit, science shops employ them both to define their mission and to utter critique towards conventional practice.

By choosing selection criteria, enacting them, and making them explicit, a science shop performs three goals. First it clarifies its mission and justifies its way of doing. Second, it investigates the instrumental and normative value of the criteria. Third, through the normative claims transported by the criteria it expresses critique. Following these goals, a science shop **explores and demonstrates the instrumental and the normative meaning of the criteria.**

We have arrived at the end of our first side of the evaluation triangle. We have seen as the particular challenges for a science shop that engages with issues and publics the following features:

> Explore and demonstrate what counts as 'issues' and 'publics'.
>
> Move between a demand-driven and a proactive approach for working on intangible and unstable issue-publics dynamics.
>
> Explore and demonstrate the instrumental and normative meaning of the criteria.

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[171] To let the own identity be challenged by a collaborative research process is obviously a hairy undertaking. Such a project may encounter among community groups certainly skepticism towards university and towards the science shop itself; it may encounter disinterest, for instance due to the danger that questioning of the own identity may signify for a community group's existence; it may stand in contrast to an instrumental view of the collaborative research on the side of the community group, that may be merely in search for the 'stamp' of university under an 'independent' report. Science shop literature speaks about such community groups that literally abuse science shops, instrumentalizing them for advancing their interests (Farkas, 2002:132, 157).

[172] A further criterion could be the *"degree of innovation"* in the community group's approach towards their issue (Callon, 1999). A community group that advances its own 'research in the wild' may be a particularly interesting counterpart for establishing an equivalence in expertise and contribute to a transformation of research at university.

2.3. The articulation of issues and publics through collaborative research

In this section, I will discuss the three analytical moments in the issue articulation of definition (or framing), research, and making the research matter. We will see the particular challenges encountered in these different moments with respect to the goal of linking *concerns* to *research* and vice versa.

2.3.1. Framing the issue for collective exploration

A science shop tries to promote the exploration of an issue through *research*; a university-based science shop such as the DTU Science Shop proposes doing so by connecting it to the *university*. ,In such an undertaking, from the strong democracy perspective one would emphasize as the principal task that of staying truthful to the 'knowledge need' of the community group. In contrast, under an issue-centered perspective the task is to set up the *research collective* (Callon et al., 2009:123), searching stability at the same time as flexibility and openness.

To follow a research logic is certainly not an exclusive feature of the institutions of science and may be equally a feature of the community groups approaching a science shop[173]. When initiating a collaborative exploration of an issue, the science shop's concern is therefore to first of all become knowledgeable about different ways and possibilities of approaching the issue in order to define a *research potential*. It elaborates a diagnosis of both the issue brought forward by the community group and the community group's relation to it[174], and it explores possible contributions from university researchers.

When following a demand-driven approach, this definition of the research potential starts with the request of a community group, on behalf of which the science shop explores the possibilities of *connecting it to the university* (we have seen examples of this in chapters two and three). At the DTU Science Shop, this connection is sought by 'disciplining' the issue (the broad request of the Vanløse community group was transformed into a 'demand' for a

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[173] It has been in fact an important concern of science studies scholars to evidence that the spaces of knowledge creation escape such an easy classification that often relies on an unjustified 'deficit model' of expertise (Wynne, 1991, 1995).

[174] This diagnostic work is considered a decisive aspect in science shop work (Farkas, 2002:104ff, citing in particular the Nijmegen staff), that they share with other entities concerned with mediation/intermediary work for knowledge creation (Meyer, 2010).

research project in urban planning)[175]. In chapter three, I have outlined three goals of this disciplination: first, it serves for *communication* purposes (the integration of the generated demand into the catalogue, that lists the community groups' demands according to a number of disciplinary categories); second, it is a means for the *interessement* of the university students and researchers (creating an attractive academic option for them as an academic exercise or a research project); and third, it provides already an *initial orientation of the exploration* of the issue in terms of the methodological and theoretical approaches to be employed.

When the science shop follows a proactive approach, the definition of the research potential starts at the academic side, and the decisive step is now the connection to *a community group* that could be a possible public concerned by the issue chosen for exploration. The movement may then be the opposite of a disciplination, as we have seen in the case of the Taller de Barris: here, the rather concretely defined technical frame adopted in the beginning was opened and widened in order to be able to connect to the concerns mobilizing the community group.

Once a collective has been set up for the exploration of the issue, the framing continues with the definition of the project. The project is framed in this moment in terms of the resources to be used, the time planning, its status for the different participants (an activist project, an academic exercise), the theoretical and methodological focus to be adopted (defining for instance the district as a unit for analysis, concentrating on the energy problem or traffic, etc.), and the contributions each member of the collective makes to the process (including the community group's participation which is generally defined according to the "unique conditions of each case", Farkas, 2002:249).

To define the project means thus to engage a variety of actors and things in order to make up the research collective. It means to create a common project that should certainly still be attached to the concern of the community group but that needs also to respond to this diversity – for instance with respect to different attachments to the issue, temporal dimensions[176], language, or to the ways of handling complexity between systematic inquiry and tactics. The response to such diversity may be a very concrete, well organized and efficient

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[175] In chapter 2, I remarked that the Nijmegen Science Shop seemed to have had a different way of connecting, organized through specialized thematic groups that explicitly defy the boarders of disciplinary project definitions (Farkas, 2002:88).

[176] We have seen for instance in the Vanløse collaboration that academic time frames often do not correspond to those of the evolution of an issue and the dynamics of public mobilization.

frame for the project, as in the Vanløse collaboration. It may also result in a rather open definition, as in the Taller de Barris, emphasizing the exploratory character of the research where the very definition of the project changed with the advancing exploration of the issue. Defining the project means to decide how far to close the definition or how far to leave it open.

To conclude, while framing an issue for articulation, a science shop balances **between (1) making up a stable research collective that holds together in spite of its differences and (2) allowing this research collective to be flexible and exploratory in order to do justice to the unstable character of issue-publics dynamics** - in short, it is about framing for *collective exploration*.

2.3.2. Defining confrontational expertise

Once an issue is framed, the task is to develop collaborative research. We have seen earlier that according to the issue-centered perspective research is not unconditionally attached to the goals of the community group; it is characterized instead by a possibly confrontational dynamic. In light of the very uncertainty that motivates the research, which impedes any easy judgment about what kind of knowledge and whose knowledge would be relevant for approaching the issue, a initial *equivalence* of the contributions of the different participants to the process needs to be assumed; an equivalence that should however be taken neither as an *equality* nor as a necessarily *symbiotic relationship* between them. The big challenge for this step is then to define what 'independent, participatory research', not being anymore an oxymoron, may mean.

In a field close to the everyday life experience such as urban planning, it should be easier to establish such equivalence than in other more 'secluded' research fields. And in fact, urban planning is certainly one of those fields that are especially rich in participatory experiences – but we find equally critical accounts, concerning the seriousness of the participatory trend and its often ambiguous benefits in terms of social (in)equalities (Jones, 2003) and for the improvement of urban planning practice (Alfasi, 2003). The CBR processes studied in the previous chapters have shown difficulties in this respect and are thus occasions for inquiring the project of promoting such a confrontational approach to expertise – of promoting critical collaborative research in urban planning from a pragmatist STS perspective[177].

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[177] The last decade has shown an increasing application of STS perspectives to the study of the city, its architecture and planning (Aibar and Bijker, 1997; Hommels, 2005; Guy and Moore, 2005). *Pragmatist* STS perspectives have been applied in recent years to architectural issues (Yaneva, 2009), and have also been employed to discuss the

How to make the step from everyday knowledge and concerns to research, from 'experientia' to 'experimentum' (Callon et al., 2009:44)? How to produce an "extended peer-review" (Funtowicz and Ravetz, 1993), a co-production of knowledge through the confrontation of claims? The conclusions we may draw from the analysis of the two CBR processes concern the use of research methods and the handling of 'participation', that is, the relationship between the community groups and the university members.

We have seen in chapter three that the second Vanløse project appeared in fact to be rather a *preparation* of a confrontational dynamic – a learning process for the students and the community group. Although the students as the principal researchers in this project appeared to follow the 'double strategy of attachment and detachment' (Callon, 1999), moving between a distant position and one closely involved with the community group and the issue, they rather avoided situations of trial due to their little training in relevant research methodologies and the narrow time frame of the project, but also due to the desire of the community group to have an 'independent' study so that it would be credible to outsiders (other residents, the administration, etc.). Due to these restrictions, the confrontation with both the district and the community group was low: the students decided not to take into account the possible 'objections' of the sites to their planning proposals (regarding their ownership, possible contamination and the existing planning regulations); and instead of a confrontation of claims, it was them who translated without much justification the 'opinions' and 'wishes' of the community group's members to accepted 'knowledge' on which to elaborate proposals. Moreover, we have seen that the community group treated the students' proposals as 'inspirations', that is, as a data collection and a set of proposals that would be taken seriously as far as it fitted the own agenda or that would be left aside if it would not prove to be of interest. We may conclude then that, according to the available resources, a certain equivalence of expertise between the students and the community group had been produced: no claim of superiority of expertise was made, being the result a non-committal exchange of 'opinions', 'wishes', and 'inspirations' - an equivalence based on a rather light confrontational dynamic while offering a high level of protection of the needs and interests of the different participants.

This corresponded to what was expected from the project. Certainly, none of the participants conceived it in terms of a realistic exploration or even an articulation of the diversity of

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emergence of public participation in urban planning (de Cozar and Sánchez García, 2004). This has however not reached our particular concern here, which is the study of the *promotion* of participation in urban planning.

perspectives involved. It was conceived as the contribution to such an articulation, as a learning process for the students and for the community group about how to do so possibly in the future. In contrast, in the process of the Taller de Barris, in the definition of the project a realistic exploration and a true articulation effort had been envisaged. The Taller de Barris sought to work on the district's problems through an approach that we have characterized as one of 'sensibilization': it aimed at supporting through its research the emergence of issues and mobilized publics simultaneously, by employing sophisticated research methods in combination with participatory exercises. Here, the confrontational dynamic was initially not excluded – and produced much uncertainty about how to inquire representations and about how to leave room for questioning one's own representations.

This uncertainty was (at least) threefold:

- The first steps of the TB were characterized by a focus on the *confrontation with the district* in order to adapt its agenda to the issue it aimed working on. But while exploring the issue, this very issue was changing. This was a consequence of both the exploration and of a changing composition of the TB that led to new ways of framing its approach as well as the issue. A first uncertainty was thus how to define the methods to be employed in order to make the issue 'speak' in the light of the issue's fluidity (see previous section).

- In the confrontation of its approach with the association and the district's residents, we have seen that on the one hand, a confrontational dynamic was difficult to produce in the spaces the TB had created for this aim (particularly evident in the second workshop). On the other hand, the TB had to take decisions on what would be relevant and useful confrontational processes in relation to its goals. It had to decide whether and how to engage with existing but very 'oppositional' dynamics of mobilization (as for instance with respect to the parking question, where the Taller de Barris did not connect to the existing mobilizations but decided instead to frame the problem differently by including it into the wider question of mobility). The TB was confronted with the uncertainty around what kind of mobilization would be an appropriate basis for the desired collaborative research.

- Third, the TB had to decide how far to inquire the representational dynamics within the association. The process became directly associated to the inner politics of the neighborhood association, as it was associated with the promotion of a more

participatory dynamic within the association. It got this way involved to a certain degree in 'identity work' on the side of the association. This involvement was perceived by some as conflictive and created a difficult position for the group in relation to the association: it was not clear what the right way of questioning of the association's representational dynamics would be.

The examples show that the definition of science shop CBR as simultaneously independent and participatory – or critical and collaborative – is in fact, again, a program for exploration. Ceasing to be **a contradiction**, **'independent, participatory research' is a goal to be constantly explored and redefined in each particular case**.

In the next section I will discuss a closely related but slightly different challenge that science shop work sets out to work on: that of being *useful at the same time as being reflexive* when promoting socio-technical change.

2.3.3. Opening while being constructive: useful results versus public-ization

How to contribute to socio-technical change through community-based research? We have seen in chapter two that the DTU Science Shop considers the *usefulness* of a CBR process for the action goals of the community group an important means for doing so. We have seen at the same time that in the work of the DTU Science Shop, the action goals of the community groups are not blindly subscribed but considered in relation to the public-ization of the issue worked on. It is this balance between usefulness and public-ization to which this section now turns.

We have seen that in the two CBR processes analyzed in the foregoing chapters, an explicitly *constructive* approach was adopted in order to elaborate proposals that should serve for supporting a 'good city' or a more ecological one; at the same time in both projects the wish of being constructive was considered a delicate undertaking that was to be accompanied by movements of widening the range of actors and perspectives. Other examples have shown that the DTU Science Shop considers as its task the promotion of a kind of public dimension of its CBR processes that goes beyond the interests of the particular counterpart, for instance by making the results publicly available - as was the case for the carsharing process (see chapter 2), where the science shop intervened for increasing the public character of the results. Yet, this very case has shown as well that making the research results public is not necessarily considered the best strategy for translating these results into a publicly available innovation.

When participating in projects that challenge the privileged place of private car-use in the mobility system of Copenhagen and Denmark, the DTU Science Shop may support a strategy of partially avoiding the publicization of the research results: it may adopt a strategic attitude in order to support a niche technology (Kemp, Schot and Hoogma, 1998) for challenging the obduracy of established technologies or technological frames (Bijker, 1995).

As any project that seeks to promote a technoscientific development that is respectful of society and the environment, science shop work is caught between supporting action, which carries with it decision making about what to do and who should be involved in it, and opening such decisions for a wider public and for exploration over time. It is caught between *taking action* on issues and *enlarging knowledge* about the uncertainties involved in them. This tension has been coined as the Collingridge dilemma (see chapter one), composed of an 'information problem' and a 'power problem': impacts cannot be easily predicted until the technology is extensively developed and widely used; at the same time, control or change is difficult when the technology has become entrenched (Collingridge, 1980). This dilemma has been rejected by constructive technology assessment scholars who hold that introducing participation during the entire innovation process would resolve this supposed opposition of knowledge and control (Rip, Misa and Schot, 1995:7,8). The three criteria given by constructive technology assessment – anticipation, reflexivity and social learning – are supposed to guide interaction in this sense.

The issue-centered science shop stands close to this proposal and may be understood, as I suggest in this section, as a particular and original proposal in this sense: its basic ingredient, the collaboration between university members and community groups, forces these different actors to *balance together* between action and reflection, to try anticipation, and to make its process socially relevant. The particularity of science shop CBR is that it does not only widen the spectrum of perspectives, permitting this way a kind of inter-reflexivity; issue-centered CBR *integrates the action-oriented dynamic of the community groups in the research process and brings so the very tension between the need for action and the need for exploration into the process*. The presence of very real action goals of the community groups forces the research process to articulate not only knowledge but also identities: it forces the research collective to make the research relevant for the mobilization around the issue (or, taking up the distinction introduced in chapter one: to link the *politics of design* to *policy making*). If this was the only driving force of the research process, it would quickly lead towards the instrumentalization of the research. But action-orientation goes hand in hand with the

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declared mission of the science shop in opening up research. The political significance of this movement between opening up and closure has been widely dealt with by scholars of science and technology studies[178]. Some of these scholars stress the general need for acknowledging the positive value for democracy of the *opening* of issues to public scrutiny (Marres, 2007; Stirling, 2008), in response to tendencies that overemphasize the instrumental character of public participation. Others invoke at the side of this "requirement of publicity" a "requirement of closure" (Latour, 2004:110,111) and highlight the need for balancing between the two extremes of opening up and decision making by seeking 'measured action' (Callon et al., 2009), or by playing a "mixed game" (Mouffe, 1999; Elam and Bertilsson, 2003). Echoing these demands, science shop work may be understood as negotiating between the *divisibility and the indivisibility of issues*, to adopt the metaphor used by Albert Hirschmann (1995): on the one hand, the action orientation of science shop CBR obliges working on the divisibility of an issue in spite of its complexity. On the other hand, its quality of critical research may be understood as an effort for dealing with the indivisibility of the conflicts – for discovering an issue's wider entanglements that prohibit an easy classification of the issue as solvable through compromise. The interest of the exploration lies precisely in making the issue grow, in enriching the debate with evidences about those aspects left out, in avoiding premature closure.

Similarly to the other already discussed aspects of issue articulation, to promote CBR in the balance between opening up and closure is a difficult undertaking. We have seen that science shop literature often emphasizes the ease of science shop work, being beneficial for everyone participating (e.g., Mulder et al., 2006). In an issue-centered CBR, the results may be less tangible, less measurable, *less useful* than those produced by a more action-oriented CBR. Issue-centered CBR challenges the meaning of useful (or constructive) research. This challenge takes a different shape for the different participants:

- The less certain promise for useful results might present itself as a difficulty for the community group that participates in a CBR process: the community group is meant to participate *because* of its action-orientation, *because* of the concerns that provoke its mobilization around the issue in question – and is somewhat paradoxically asked to

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[178] In this respect, Sismondo (2007) offers an overview of discussions in the field of science and technology studies about the interest and the difficulties involved in making a distinction between a theoretical interest for analyzing science and technology and an activist approach, proposing an 'engaged program' that is supposed to overcome their separation, denounced for instance by Fuller (1993) with his discussion of the "High Church" and a "Low Church" of STS.

engage in a research dynamic that might entail a questioning of these very action goals. Not all community groups may be interested in or capable of such an approach But there are certainly those community groups that are interested in engaging in exploratory CBR that does *not assure* useful outcomes. For instance, in the Vanløse collaboration, the community group's members were certainly interested in useful outcomes; but they actually did not seem to consider that this usefulness should necessarily lie in the applicability of the projects. Their stated goal was to *learn* about their issue and they understood their action goals to be in need of exploration. Their engagement with the issue of local urban planning and their collaboration with the students appeared not so much to be motivated by the 'doability' (Fujimura, 1987) of their undertaking but rather by its 'undoability' (Marres, 2009) – by the undoability at the same time as the desirability of a holistic, comprehensive (local) urban planning.

- In the case of the university researchers and the students, the challenge consists in the opposite movement: they are supposed to participate in the process for their interest in exploration, in critical research – and are asked to engage in articulation processes where the need for exploration has to be assessed against that for useful results. This certainly pushes the researchers and the researchers-to-be to discover and explore the entangled character of these two dimensions. This was the case both in the Vanløse collaboration and in the process of the Taller de Barris, where the students stated that they had experienced learning processes in this sense[179].

- Also for the science shop itself the movement between usefulness and publicity is a defiance. Tangible outcomes, true 'impacts' of the facilitated research processes are needed to justify its existence towards those who support it. At the same time, its very mission is much more complex than this – as the DTU Science Shop argues for instance towards the academic community (see section 2.4.2).

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[179] Farkas (2002) describes in this respect how at the Nijmegen Science Shop the emotional distance of a student towards the research changed from being a positive ingredient for the research process to being an undesired ingredient: "The interest in choosing a student who had a personal interest in the research reflects a concern for challenging conventional assumptions about autonomy and scientific researchers (part of the partnership model). Again, van Aalst on the conditions in Nijmegen: 'Early on, when a student came to do a research project, their background was considered as a factor for whether they would do the research. For example, for a research question from a women's organization on divorce, the science shop might prefer a student with divorced parents. I think the attitude has since changed—and sometimes even the opposite is true: an emotional involvement with the research subject might be a legitimate reason to turn someone away. (van Aalst 1998)' " (p.65)

Again, we see that the balance between usefulness and reflexivity makes science shop work difficult at the same time as it offers spaces for inquiry. While science shops certainly struggle with defining their CBR between action and research, they are at the same time a means for exploring the blurred lines between both. They are a means for demonstrating the potentials and limits in this regard on the side of the community groups, the university members, and the science shop as the CBR's facilitator. **The *usefulness* of research, that causes so easily suspicion but that constitutes nevertheless a decisive feature of science shop work, acts as a counterbalance to the acclaimed democratic principle of opening up. This way, a science shop explores and defines what "useful and public research" may be.**

To conclude the discussion of the movement from the issue to its articulation, we can retain as relevant aspects of science shop work:

> Between a stable research collective and an exploratory approach: frame for collective exploration.
>
> "Independent, participatory research": explore the potential of collaboration for knowledge creation based on confrontation.
>
> "Useful but public research": explore the tension between research and action, between opening up and closure.

Let me now turn to the role of the science shop as a mediator for an issue articulation.

2.4. Being a mediator of issue articulation

We have seen earlier that in its role as a mediator, the science shop assumes the responsibility for articulation, at the same time as it acts as a positioned actor itself that aims at working not only on one issue but at taking influence on the university's role in the articulation of a large number of issues. I will discuss three challenges that our cases have shown:

- Assuming such responsibility, the science shop is confronted with searching appropriate frames to be exploited or created for the promotion of critical CBR at its university and its environment;

- When promoting critical CBR to be done by others (university researchers and students, the community groups), the science shop necessarily delegates not only the research but also part of the responsibility for its democratic argument of issue

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articulation. It needs to balance then between delegating but not abandoning this responsibility;

- Last but not least, as a mediator of issue articulation, the science shop promotes the exploration and demonstration of the many uncertainties linked to its project (discussed throughout the different sections composing this very framework). A science shop thus offers itself as a device for experimenting with these uncertainties[180], and it needs to convince of its value as such a device.

So let's restart our discussion of the evaluation triangle with the question about the *frames* for critical collaborative research.

2.4.1. Exploring frames for critical collaborative research

The search for appropriate frames for critical CBR means to exploit the potential of existing frames for doing so as well as going beyond them by widening them or creating new ones. This may be considered to be an opposition: the structural integration of science shop work into the university allows to influence and reform it but limits the radical challenge of these very structures. We will see that although this dualistic perspective does not do justice to the cases discussed in this thesis, it points to a further challenge in science shop work.

We have seen in the thesis that the DTU Science Shop moves between the acceptance of existing frames and their widening. The DTU Science Shop's organizational design shows a structural integration to university, which is dear to the Science Shop: it considers that because its staff also performs teaching assignments and research at the DTU, it has more access to those activities at the DTU and more influence on it. This way, it can exploit the potential of the academic exercises (such as bachelor or master theses, or project work) of the DTU students, at the same time as it widens their sense. Nevertheless, the example of the DTU Science Shop shows also well that the capacity of moving beyond existing frames depends very much on the availability of the corresponding resources; it depends on the support received from its university's government and other actors within the DTU. While during its times of

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[180] The notion *demonstration* may carry both a scientific and a political meaning, as Andrew Barry points out in his book *Political Machines*: "In English, the term demonstration has referred both to the scientific activity of showing an object or effect and to the political activity of public protest" (Barry, 2001:32). Barry argues "that these two senses of the term are closer together than is generally imagined"; an argument that he convincingly develops on the basis of his study of the conduct of road protests in southern England in the mid-1990s. My argument follows Barry in referring to 'demonstration' as a scientific and political activity, considering it part of the wider effort of *experimentation* as outlined earlier.

strong institutional and financial support, the Science Shop had an important capacity of innovation, the reduction of this support meant that this capacity became more limited.

The case of the DTU Science Shop shows on the one hand that science shop work needs resources for producing the desired processes of issue articulation. On the other hand, disposing today of rather low resources, it often relies heavily on students' projects and discusses how good CBR may be assured in spite of the limitations of such projects in terms of political involvement, time frames and scientific level (Brodersen and Jørgensen, 2003) – its work can thus be taken as a demonstration of the potentials and limitations of this kind of frames within the university (academic student exercises) for issue articulation; it is an exploration of the difficulties involved in the combination of the educational and the research function of the university (Leydesdorff and Ward, 2005). Several aspects can be highlighted in this respect:

- First, to work with students means to accept their interest in learning about their disciplines as the motivation for participating in a project. The DTU Science Shop's handling of the 'disciplination' of the issues (see section 2.3.1) shows a balance between accepting the disciplinary approach as a mode of connection to and engagement of the students and caring for the non-disciplinary character of the community group's concerns. This shines through for instance when in the catalogue identical demands are listed under a variety of disciplinary categories. The Science Shop also seeks in the definition and the execution of the research projects to introduce wider perspectives (when it disposes of the relevant knowledge for doing so). The capacity for moving beyond disciplines, which is an exigency of good CBR (Strand et al., 2003) is, however, restricted when working with lowly trained students: interdisciplinary research builds on the mastery of the involved disciplines.

- Second, while relying on students' labor for doing the research meant that a low-resource approach and a connection to university education could be assured, this also created limitations. These academic limitations may be counteracted by academic supervision. If a higher quality is to be achieved than that envisaged in the academic requirements for such exercises, the solution means to go beyond conventional supervision (Strand et al., 2003; Leydesdorff and Ward, 2005)[181]. Scientific quality

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[181] Leydesdorff and Ward conclude from the INTERACTS case studies that the possible lack of the necessary knowledge resources and research capacities was recognized as a problem to be aware of by the participant science shops; these sought to confront it through "quality control … for example, in terms of the demands for supervision

needs some degree of integration of the project into the scientific interests of a supervisor or it requires working with students that have a more than initial training in the knowledge field and the associated research methods (Strand et al., 2003)[182]. When a strong supervision or integration into a research area cannot be guaranteed, the ambitions of the projects need to be certainly more modest – which was the case in the Vanløse project.

- Third, the CBR processes proved difficult with regard to the question of the *continuity* and *depth* of the exploration of the issues in question (Callon et al., 2009). In principle, longer time frames appear to be more adequate for a careful exploration of an issue - they are however not a sufficient condition as the process of the Taller de Barris showed. If working with the particularly short time frames of typical students' academic exercises, continuity may be produced either by introducing into the curriculum opportunities for more long-term involvement (Strand et al., 2003) or by 'follow-up research' – as the DTU Science Shop aims at when discussing in the final meeting of a CBR project possible new 'knowledge needs' resulting from a project. Also the second project of the Vanløse collaboration was meant to be a follow-up project to the first one, by concentrating on one particular traffic problem that the first project had dealt with. We have seen here that the interest for working on matters of concern of the community group led to put aside the goal of continuity in order to focus on more urgent questions, such as the development of the vacant lots in the district's center.

- Fourth, when relying on students' work, the exploratory and confrontational dynamic of the exploration is likely to be rather low. When comparing the process of the Taller de Barris to the Vanløse collaboration, for the former the exploratory and not institutionalized frame demanded from the students a high involvement beyond the exigencies of an academic exercise and offered little 'protection' for them;

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of the M.A. students involved" (Leydesdorff and Ward, 2005:360). The emphasis on the need for high quality and for important resources in terms of knowledge, financial means and institutional support has been made by science shop practitioners and scholars (Hall and Hall, 2007; Leydesdorff and Ward, 2005). It is especially present in the US literature on CBR (e.g., Strand et al., 2003; Stoecker, 2005), where such resources seem to be available in a higher degree.

[182] One such mechanism is to establish a "quality threshold" in the selection of students to be admitted (Hall and Hall, 2007:134). In a similar direction, Strand et al. (2003:150ff) discuss the kinds of knowledge and skills students should have before undertaking CBR.

consequently it connected to a kind of university students driven by activist motivations while it was not successful in integrating one student that considered his participation principally as an academic exercise. In contrast, in the Vanløse collaboration the high level of protection through clear agreements and a well organized planning was particularly suitable for an academic exercise – accordingly, the level of confrontation and flexibility in the exploration was low.

Not all but most of the current DTU Science Shop's work relies on undergraduate students projects. As a university-based science shop, the DTU Science Shop explores the possible frames for CBR at its university. For doing so, it relies on a rather well-established, existing format (undergraduate student projects) and seeks to explore its potential for taking forward its goals. In contrast, the Taller de Barris was a rather informal initiative and not installed at the Universidad Politécnica de Valencia although there were some connections to the university; it sought to exploit the possibilities of existing frames, at the same time as it created its very own frame. As a pilot project for a science shop at the Universidad Politécnica de Valencia, this exploration may translate in further innovation in this respect.

We may now return to the question that opened this section: are institutionalization and radical critique impossible to combine in science shop work? Joseph Wachelder's account of the evolution of Dutch science shop is here illustrative. In his opinion,

> "the closing down of the Leiden science shop makes clear that to some extent, Dutch science shops failed to adapt their ideological underpinnings to a changed political climate. In the late 1970s, when science shops emerged one by one, their ideological base was unambiguous. *They all reflected leftist ideals associated with the effort to radically change science and society*. But in the 1980s, most science shops, supported by a governmental science policy aimed at enlarging the social impact of science, turned into professional intermediaries and became an integral part of the university organization. Their ideological foundation was weakened, and they largely became extensions of the aims and goals of the progressive social groups they served." (Wachelder, 2003:257, my emphasis)

Wachelder suggests not to abandon the science shop project for not fitting anymore into the ideological frame of the movement's beginnings, but to reconsider this very ideological frame in order to make the project possible. To reconsider this frame means to reconsider what it means to be 'radical' as a science shop within today's universities. An either-or thinking (being either reformist or radical, being either integrated into university or independent from it) ignores the difficulty of actually determining *what the university is in society*. The changing role

of universities and other scientific institutions is a topic of current scholarly debate with a number of competing "diagnoses of changing science systems" (Hessels and van Lente, 2008:740[183]). This debate also concerns concepts that science shop work appears to be closely related to, such as "reflexivity", "social accountability" or "transdisciplinarity" (which are core concepts of the mode 2 argument, see Gibbons et al., 1994), concepts whose nature and presence in university research and education are far from consensual (Hessels and van Lente, 2008)[184].

Through its inquiry on frames for critical CBR, a science shop participates in the exploration of this uncertainty; this may be 'radical' as it means to critically inquire the definition of such boundaries and roles by engaging with them[185]. A science shop participates in this exploration both with an analytical and with a normative concern[186]: analytically, such exploration advances the science shop's reflection about its own project; normatively seen, it is a means for participating in the definition of the mission of its university. **Science shop work may be understood in this sense as contributing to the (re)definition of the university through the definition of appropriate spaces for issue articulation**.

In this search for appropriate spaces, the science shop searches also an appropriate definition of its role as a mediator of issue articulation. This is what I will discuss in the next section.

2.4.2. Delegating the articulation while staying responsible for it

To assume the role of a mediator means to find a balance between assuming responsibility and delegating control: a science shop assumes responsibility for the critical character of the

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[183] See chapter one for a discussion of related concepts.

[184] Focusing on the educational aspect, particular attention should receive the implementation process of the European Higher Education Area (Reichert and Tauch, 2003). This brings about challenges and opportunities for promoting a critical role of universities (Boni, 2006). Attempts of promoting in this frame reflexive or 'ethical' learning in university education help to explore these challenges and opportunities; attention needs to be paid here to the diversity that characterizes university education for instance with respect to disciplinary differences (Boni and Berjano, 2009).

[185] Science shop work may be then also phrased as 'boundary work' (Gieryn, 1983), echoing McMillan's (2009) interpretation of service learning in this sense. However, McMillan emphasizes here, drawing amongst others on Star and Griesemer (1989) and Bowker and Star (1999), the role of service learning in *crossing* the boundary between university research and education and society. Boundary work is conceived as work across boundaries. In contrast, the here exposed perspective is concerned with the very definition and enactment of these boundaries while challenging them, which, in fact, appears to lie closer to Gieryn's original discussion of the concept.

[186] Science shop practice echoes hence the ambivalence of the mode2 discussion between analysis and normativity (Godin, 1998:467), equally described in chapter one, note 8. However, I argue that this should not be considered a weakness if both dimensions are recognized.

processes of issue articulation, at the same time as it delegates the issue articulation partly to others – it relies on a 'division of labor' between the different participants (Strand et al., 2003:63/186). It is then the question how much a science shop can delegate control while remaining responsible and knowledgeable about the articulation, and thus responsible of the contribution to democracy of its work.

We have seen in the previous chapters that the DTU Science Shop moves between the two extremes. In the Vanløse collaboration, it was actively involved in the definition of the projects and in their execution. In this involvement it did not control the entire articulation, but delegated to a large degree control over academic quality to the academic supervisor and control over the 'political' articulation process to the community group.

The important degree of delegation that the DTU Science Shop shows today is the result of its particular history, discussed in chapter one. In its beginnings, it was given the organizational form of an *Interdisciplinary Center*, held by five departments of the DTU. This anchorage of the Interdisciplinary Center to different spaces at the university made an important networking activity possible. A central part of the Center's work consisted in promoting and coordinating its so-called 'renewal activities' (consisting in the development of new courses and research programs that counted with a strong support of its university). The degree of involvement in, and control over, the promoted research processes was considerable in these early years. We have seen that along with a number of structural changes at the DTU, the Interdisciplinary Center lost structural anchorage and resources, evolving to a department-based Science Shop.

We could say that the Interdisciplinary Center, once confronted with the reduction of its resources and institutional support, developed some of its features more strongly and reduced others: it specialized as a generalist participatory device and it reduced the volume of its research activities. It became clearly different from the research groups on urban ecology and organic food catering that had coevolved with it. Although it continued to share with them the participatory and sustainability working philosophy[187], specializing on its role of a participatory device, the Science Shop would assume to deliberately delegate academic or scientific control over its research processes. This delegation would add to that of the articulation with the world of decision to the community group. *The degree of these two delegations distinguishes a*

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[187] In the case of the urban ecology group, at least a part of its members show here an attitude that appears to be very close to the perspective of issue articulation proposed in this research: when discussing here role as an evaluator of a project carried out between several community groups and a public administration body, she described herself as not being excessively attached to any of the perspectives of the different actors but to the point of view of sustainability.

science shop from other efforts directed towards the articulation of issues: if a science shop would not delegate (at least partially) the responsibility for academic quality to other researchers at its university, it could in fact not be distinguished from a research group doing critical research. If it would not delegate the responsibility for the action-component of the articulation to the community group, it would be a public itself. If the delegation would be total, the science shop would be an apolitical intermediary that merely connects others – which is not what the Science Shop envisages and which in fact does not appear to be a possible role. By delegating these two kinds of responsibilities *partially*, a science shop is partially a critical research group, partially also a public concerning the issues it works on – and it is able to become a participatory device that encourages others to engage in efforts of issue articulation and supports them in doing so.

Delegation distributes the issue articulation, making it a collective effort, and it permits a science shop to pursue a wider impact on the whole university, using its limited resources for facilitating a considerable number of projects per year. At the same time, the broader the range of projects facilitated by the science shop, the lesser its involvement in each, and the more fragile becomes the connection of these particular CBR processes to the science shop's wider project of transforming the university. In the case of the DTU Science Shop, we have seen for instance that the Vanløse collaboration contributed only to some of the Science Shop's goals and did not connect to the wider project of transforming the research agenda at DTU. Equally, the Science Shop's research assistant was only to a limited degree able to get involved in the contents of the research and to contribute to its critical character. In contrast, we have also seen that in order to influence the DTU's research agenda, the Science Shop's coordinator participates in certain research activities without relying on a CBR project for doing so (notably in his field of specialization) – playing with the ambivalence in his position being both the Science Shop's coordinator and a DTU researcher. *The connection of the particular CBR processes to its general goals gets hence more fragile in two senses:* both with respect to the contribution that each CBR process makes to the whole, and with respect to the contribution that the whole makes for each CBR process. In fact, we have seen that some of the participants in projects facilitated by the DTU Science Shop showed to be simultaneously *supportive and critical of* the Science Shop's goals; more so, according to the meaning of the project for their personal process, each participant interpreted the sense of the Science Shop's work differently: there was certainly not one shared vision about it.

A science shop is hence confronted with the double task of making its effort a collective one and of making the collective effort its own. And the same as it needs to constantly re-create the connection between the particular CBR processes and its general goals, it needs to do so with the other elements constituting its network: a science shop needs for instance to maintain engaged its sponsors (its department, the DTU government, the tax payers as it is being financed by public money), to gain the interest of its academic peers (those scholars concerned with the academic discussions that relate to science shop work), or to make itself relevant to other practitioners (who may partly coincide with the academic peers). We have seen in chapter one that the DTU Science Shop uses different languages to conquer, maintain, or justify its position towards these different groups. When talking to the DTU government and that of its department, its coordinator speaks of its contributions to the university's strategy (the DTU's 'development contract', Danmarks Tekniske Universitet, 2006). There, he addresses in particular its role for the DTU students' education, certainly the aspect of the development contract that offers most of the 'points of contact' between the DTU's strategy and the Science Shop's mission. When participating in scholarly discussions, the Science Shop's staff defends for instance the still important role of science shops in spite of changes in universities and in the science shops' 'clientele' (Brodersen, Jørgensen and Hansen, 2006, in response to the article on science shops issued by Leydesdorff and Ward in 2005). With respect to other practitioners, it contributes for instance to the exchange of experiences and best practices through its participation in the European project TRAMS that supported the creation of new science shops[188].

The degree of acceptance of such justifications by the different parts of the collective serves at the same time for updating the science shop's identity. By configuring and enacting this way its particular collective, a science shop configures its particular challenge of dealing with delegation and responsibility. Such collectives change over time, as the history of the DTU

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[188] There are attempts to address these different peer communities simultaneously as for instance in organizing very practice-oriented Living Knowledge conferences or by producing reports on science shop work that are targeted to both academic peers and university management and the European Commission as sources for institutional support. As we have seen in chapter one, this is not free of difficulties: reporting science shop work may easily become mostly concerned with justifying its impacts. Also on the level of particular CBR processes, the intent of addressing simultaneously the community group and the academic environment may pose difficulties. To prioritize the second target audience may result for instance in a lack of communication with the community group (as we have seen in some way in chapter four concerning the Taller de Barris). It may in the other extreme mean to neglect the academic peers, as the translation of CBR into academic publishing proves challenging, for instance because CBR may produce results in different formats and with different methodological principles than the conventional ones (Stoecker, 2005; McNiff, 1995).

Science Shop has shown. Other science shops at other places and in other moments may find other ways of balancing between the two poles, adapted to their particular environments and to the actors that may condition their work. With its particular and situated balance between delegating and keeping control, a science shop makes the collective out of which it is composed define the **relationship between its nature of a participatory device and its mission of contributing to an issue articulation, that is, the realization of its democratic argument**.

2.4.3. Being the promoter and the object of experimentation

While the ideal science shop is certainly impossible to build, we need an ideal for guidance: the different aspects of science shop work outlined in the foregoing sections define this ideal at the same time as they invite for its exploration. In this section, we will be interested in the task of making this collective exploration, which is disordered as it emerges from diversity, a *systematic* one, guided by the goal of knowledge production.

The framework for evaluation exposed in this last chapter acknowledges the many uncertainties involved in science shop work and is reluctant to accept or propose any 'recipes'. It emphasizes the situated exploration of these uncertainties among the particular collective that constitutes a particular science shop. One might conclude that in the light of such overwhelming uncertainty and situatedness, no learning about science shop work would be possible. Such a conclusion is based however on a misunderstanding of the issue-centered approach. This certainly does not deny learning and advancement. Nonetheless, it holds that instead of resolving doubts once for all through universal rules, clear recipes and alike, to advance in the resolution of problems characterized by uncertainty requires an *experimental approach* (Dewey, 2004, Latour, 2004, Barthe and Linhardt, 2009): a systematic approach to learning through trial and error, of action and reflection (Muniesa and Callon, 2007).

The more a science shop searches to make the collective exploration a systematic one, the more it proposes itself as a means and as the object of collective experimentation - or as a *valuation device* (Doganova, 2010). In science shop work, such valuation may be considered to combine the exploration of the uncertainties involved in its work and the enactment and demonstration of its (preliminary) responses in order to make its exploration matter - for instance in terms of knowledge creation and of the politics of its mission.

As a participatory device a science shop is asked to take such systematic experimentation seriously. This appears to be not only an instrumental demand but also a normative one: as a

participatory mechanism, it should be *transparent and clear about its own actions* (Callon et al., 2009); for collective experimentation to produce learning, we must "keep track of the path we have taken" (Latour, 2004:200). Such exigency may be translated into demands for an appropriate documentation of science shop work[189], as well as into demands for taking the theoretical discussion of science shop work more seriously (Wachelder, 2003; Leydesdorff and Ward, 2005; Farkas, 2002).

But, again, our cases speak of the difficulty of fulfilling this exigency, in the light of scarce resources and also due to the riskiness of doing so, as well as with respect to the challenge of creating theory from the own practice.

Concerning the first type of difficulties, the case of the DTU Science Shop is illustrative. It would invest more time in documenting, evaluating and discussing its work if it would have the time, the money, the human resources, etc. for doing so. More so, its vulnerable position restricts the critical character of such documenting, evaluating and discussing. When investigating the uncertainties and ambiguities involved in its work, a science shop demonstrates the potentials and limitations of its work in relation to the available resources and to the circumstances. This is necessarily a (self-)critical regard on the own performance and on the circumstances of this performance, which may increase the vulnerability of its position: the demonstration of the limitations and failures both of the science shop itself and of its environment may not necessarily be beneficial for maintaining for instance the institutional and financial support it relies on. Science shops may be in need of giving generally positive accounts of its work, emphasizing the importance of the 'impacts' of its work, as we have seen in the example of the DTU Science Shop in chapter one (institutionalization appears thus to be a limitation for being critical, see previous section). Nonetheless, accounts of its work that are too one-sided or uncritical are likely to deprive a science shop of the opportunity of discussing this work with other actors that it wants to get interested or engaged, as for instance for those 'academic peers' that could be interested in the science shop's critical analysis of its contributions to the different academic discussions, clarifying the nature of the challenges involved in science shop work (Irwin, 1995).

The case of the Taller de Barris allows to make the step to another kind of difficulty, different from the lack of resources or the risky character of critical evaluation: that of building theory

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[189] Fischer, Leydesdorff and Schophaus highlighted in this respect in their study on science shops the lack of accessible documentation of science shop work: "The difficulties in data collection can already be seen as a relevant insight into the informality of the work of science shops. The work is in many cases not very well documented, or difficult to access. Results of projects are often published as grey literature." (Fischer et al., 2004:203)

from practice. To describe one's own practice and participate in theorizing about it should not be considered a fundamentally different endeavor. Narrative, descriptive, story-telling accounts have gained their place in theoretical reflection (Latour, 2005; also Haraway, 1994, Law, 1992). But to reject a clear separation of description and theorizing does not mean to take just any description of the own practice as a 'good description' (Latour, 2005:128ff). Good descriptions, or 'risky accounts' should envisage accuracy and completeness, at the same time as they will never be able to achieve them completely (ibidem, p.133). This tension has been present in my interpretation of the experience of the Taller de Barris, as I have discussed in the corresponding chapter. Moving between telling our story and making sense (theory) out of it, my efforts to describe and interpret the experience adequately went hand in hand with an exploration of what it could mean to elaborate an accurate and complete account of it. This was so during the process, where I took decisions on the kind and degree of documentation of the process. Once the process had concluded and the material was there, I had to decide how far to follow its connections elsewhere. I had to decide what theoretical approaches would be relevant for theorizing about this experience on my own and get knowledgeable about them. I had to decide who should be my peers to accompany the process of theorizing. Similar decisions are to be made by a science shop that wants to engage in making sense out of its work[190]. With these decisions, a science shops defines its particular way of making the step from contributing from its practice to advancing knowledge about its project. Also here, a science shop explores and clarifies what its very project of democratization is and can be.

Systematizing its experience and writing down risky accounts of its practice allows a science shop to extend the issue articulation to those it considers its peers: those concerned with learning about similar questions. It means to articulate the very particular politics of its own work with dynamics of knowledge creation – it may mean in particular to reconnect science shop work and STS scholars (as called for by Farkas, 2002:236, 251) and to participate in the academic debate of engaged STS work. But, **systematization is risky and never really possible – the last of the framework's axes of problematization is precisely that of the science shop offering and valuating itself as a device for experimentation**.

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[190] With this comparison I certainly don't ask science shops to engage in theory-building as I do with this PhD research. But I do suggest a common concern for making sense out of science shop work. This common concern provokes that similar decisions are taken concerning the way of making such sense - although in different formats, counting with different resources and responding to different circumstances, etc.

To conclude the discussion of the movement from the issue articulation to the mediator, we may retain as the relevant aspects of this dimension of evaluation:

Contribute to the (re)definition of the university through the definition of appropriate spaces for issue articulation.

Promote a collective investigation of the relationship between a science shop's nature of a participatory device and its mission of contributing to an issue articulation.

Offer and valuate the own role as a device for experimentation.

2.5. Synthesis of the dimensions of evaluation

The discussion of science shop work in this chapter allows us to complete the evaluation triangle with concrete 'items' for evaluation, that is, aspects that need to be explored through science shop work:
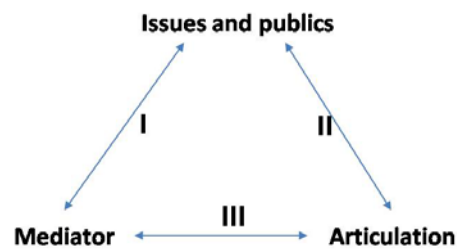
DIMENSIONS	AXES OF PROBLEMATIZATION
I – Engaging with issues & publics	I-1 Explore and demonstrate what counts as 'issues' and 'publics'.
	I-2 Move between a demand-driven and a proactive approach for working on intangible and unstable issue-publics dynamics.
	I-3 Explore and demonstrate the criteria for selection in their instrumental and normative meaning.
II – Articulating issues and publics through research	II-1 Between a stable research collective and an exploratory approach: frame for collective exploration.
	II-2 "Independent, participatory research": explore the potential of collaborative research for knowledge creation based on confrontation.
	II-3 "Useful and public research": explore the tension between research and action, between opening and closure.
III – Be a mediator of issue articulation	III-1 Contribute to the (re)definition of the university through the definition of appropriate spaces for issue articulation.
	III-2 Promote a collective investigation of the relationship between a science shop's nature of a participatory device and its mission of contributing to an issue articulation.
	III-3 Offer and valuate the own role as a device for experimentation.

Table 5.2. The three dimensions of the evaluation framework with nine axes of problematization.

CONCLUSIONS

In this last chapter of the thesis, the synthesis of the theoretical argument developed in the foregoing chapters has made the ground for a framework for the evaluation of science shop work. Starting from a critique of an interpretation inspired by a strong democracy perspective, I have provided a synthetic presentation of an alternative pragmatist STS perspective. I have developed a framework building on three dimensions of this perspective: issues and their publics, articulation, and mediation. By making the step towards a framework for evaluation, I have assumed the need for an operationalization of the proposed analytical perspective. However, in doing so, I have avoided to provide clear evaluation items to be applied for

external objective evaluation, an endeavor that I have discussed critically. Instead, the framework invites to *problematize* science shop work according to the different dimensions of issue articulation in a constructive way, and gives nine axes of problematization for structuring such problematization. It suggests (re)considering science shop work as experimentation on the uncertainties and challenges involved in its mission – a call directed both towards scholars concerned with participatory mechanisms in science and technology and towards science shop practitioners.

The framework responds to the need for a new ground for understanding, practicing and evaluating science shop work in its contribution to the democratization of science and technology. As a result of a necessarily situated study, this framework does in no way claim universal validity. However, the framework relates to a number of studies on science shops; these links, highlighted in the discussion of the different dimensions, may serve as points of departure for exploring the framework's value further, studying other aspects and experiences for the international science shop network and other CBR initiatives. The framework may be "a spur to future experimental research" (Rowe and Frewer, 2000:24) in order to achieve higher degrees of generalization.

CONCLUSIONS

We may now look back and discuss the research results in the light of its objectives, as well as outline possible lines of future inquiry. The thesis was meant to explore the possible role of university-based science shops for the democratization of science and technology and to provide a framework for evaluating science shop work in this sense. This was done through the study of science shop practice at two technical universities. The exploratory methodological design of the research has allowed to look at different aspects of this practice and to do so from different angles: in the study of the DTU Science Shop's practice, I have analyzed both its wider institutional arrangement and functioning and concrete community-based research processes; the process of the Taller de Barris has been analyzed from an involved standpoint.

Throughout the different chapters of the thesis, I have developed on the basis of these analyses a critique of the widespread discourse on science shop work inspired by Richard Sclove's interpretation of Benjamin Barber's concept of strong democracy (Sclove, 1995). This critique has been presented in a synthesized form in chapter five. There I have pointed out the problematic assumption contained in this discourse of a *representativity* of the community groups in terms of civil society concerns, as guaranteed by the science shops' selection criteria. I have discussed equally the problematic conception of the role of science shops as mere intermediaries primarily concerned with supporting the action goals of those community groups. We have seen in chapter two that this interpretation does not explain satisfactorily the DTU Science Shop's practice in terms of its selection of incoming requests. Instead, an alternative perspective emerged from the analysis: the DTU Science Shop appears not so much interested in supporting specific disadvantaged social groups but in promoting the collaborative exploration of the *issues* these groups are concerned by.

Hence, the study of the DTU Science Shop's selection practice has provided the basis for developing, as a step towards generalization, an 'issue-centered' democracy perspective on science shop work. I have drawn here on the issue-centered democracy perspective as developed by Noortje Marres (2005, 2007) and on actor-network theory. Under this perspective, the democratic effort contained in science shop work may be conceived as that of contributing to the *articulation of issues* through the promotion of critical collaborative

research. A science shop may be understood as contributing to the 'public-ization' of the issues brought forward by the community groups. The attachment of the research to the community groups serves then not so much for producing 'useful' results in terms of the community groups' action goals. Instead, it provides the opportunity for the confrontation of knowledge claims about the issues in question - for working on the co-production of knowledge as well as that of identities (Callon et al., 2009). A science shop's role may be then conceived as an actively involved mediator (Latour, 2005) rather than as an intermediary.

The value of this pragmatist STS perspective has been inquired in its analytical value for understanding a second crucial aspect of science shop work: the promotion of community-based research processes on the basis of accepted requests. This has been done by studying particular collaborative research processes facilitated by DTU Science Shop and through a reflexive assessment of the experience of the Taller de Barris. These cases have equally provided insight into the possible use of the perspective for evaluation, that is, for establishing evaluation criteria and judging science shop work against them. The discussion of the cases in this respect has questioned the possibility of applying the issue-centered perspective for objective external evaluation through clear criteria or guidelines. In contrast, in particular the assessment of the Taller de Barris has shown the potential of the perspective for appreciating how in science shop practice such guidelines and criteria are simultaneously established and problematized - and with this the democratic argument performed through this practice. Our theoretical perspective has shown to demand for a conception of evaluation as a situated undertaking under an experimental approach.

Consequently, the framework for evaluation proposed on this ground asks for understanding and evaluating science shop practice in terms of experimentation. It suggests experimenting on the very mission of science shops in its uncertainties and challenges. It offers a frame for problematizing science shop work according to three dimensions of the issue-centered democracy perspective: (i) the engagement with issues and their publics, (II) their articulation through collaborative research, and (III) the science shop's role as a mediator of such articulation. The particular form of operationalization chosen in the thesis consists of a list of nine axes of problematization, developed on the basis of the study of science shop practice. This list gives a frame for engaging in a situated form in the development of concrete criteria and indicators with regard to each challenge.

With respect to the first dimension, three axes are outlined in order to conceive of a science shop's engagement with issues and publics: (I-1) to explore and demonstrate what may count

as 'issues' and 'publics'; (I-2) to move between a demand-driven and a proactive approach for working on intangible and unstable issue-publics dynamics; and (I-3) to explore and demonstrate the criteria for selection in their instrumental and normative meaning. Equally three challenges are described with respect to the goal of articulation through collaborative research: (II-1) to frame for collective exploration, moving between a stable research collective and an exploratory approach; (II-2) to explore the potential of collaborative research for knowledge creation based on confrontation; and (II-3) to explore the tension between research and action. Finally, three challenges are outlined to characterize the role of the science shop as a mediator of such issue articulation: (III-1) to contribute to the (re)definition of university through the definition of the appropriate spaces for issue articulation; (III-2) to promote a collective investigation on the relationship between a science shop's nature of a participatory mechanism and its mission of contribution to an issue articulation; and (III-3) to offer and valuate the own role as a device for experimentation.

The framework invites both practitioners and scholars to take science shop work seriously in the progressive exploration, definition and redefinition of a critical role of universities in society. Hence, this research contributes to theory-building on the role of science shop work for democracy at the same time as it offers a frame for such theory-building to take place between science shop practitioners and their peers.

This is an original contribution to the discussion about the evaluation of science shop work. It is also a situated contribution to broader discussions about the evaluation of participatory devices in their democratic performance. In this respect, one line of further inquiry could consist in situating the framework with respect to similar approaches to evaluation. Such comparison may provide the ground for taking further the discussion of the framework in its theoretical assumptions.

One especially interesting focus would be here the question of operationalization. We have seen earlier that the framework explicitly avoids providing concrete evaluation items. Instead, it prioritizes the substantive dimension of evaluation, that is, the interest for inquiring what is at stake in science shop work in terms of its contribution to democracy. I have shown that evaluation needs to be understood in this sense as integral part of the collective experimentation, and I have provided a number of aspects around which such experimentation could develop. It may be helpful to look at other approaches that suggest evaluation 'method' to be co-constructed, taking into account the need for evaluating both process and outcomes in the light of the diverse and changing nature of objectives (Syme et

Sadler, 1994). Following such a line of inquiry would respond to a concern in evaluation literature for innovative responses to the question how a substantive dimension of evaluation may be integrated with a more practical or 'managerial' one (Blatrix, 2009).

One might investigate in this respect equally the possible contributions of the study of organizational learning for understanding science shops as experimental devices. Special attention may deserve here the tools for communicating, documenting and archiving that may be investigated in their participation in a science shop's translation work, as Czarniawska (2004), inspired by actor-network theory, suggests more generally for the study of organizations. Considering that communication and documentation happen increasingly via electronic media, one might particularly be interested in the innovative potential and the performance of information systems tools to support knowledge sharing and organizational memory (Alavi and Leidner, 2001; Sambamurthy and Subramani, 2005). Building data gathering and analysis through such tools into the organizational set-up of a science shop may allow a science shop to investigate new forms of elaborating of 'good descriptions' of its work.

More so, empirical long-term study of science shop work informed by the framework could provide insight into the efforts of particular science shops informed by the framework for operationalizing it further, moving between distributedness and coordination for making this a *collective* effort. A potential candidate for carrying out such a long-term study might be the emerging science shop at the Universidad Politécnica de Valencia. The research documented in this thesis has an explicit performative character in terms of the role it has played for this project. We have seen in chapter four that the experience of the Taller de Barris had been conceived as a pilot project in this sense. Equally the here proposed framework is meant to nurture the project. This may give the opportunity for challenging the framework and developing it further between those involved in the project.

The continued development of the framework under such an in-depth and long-term approach may be certainly multiplied. Engaging more science shops into such experimentation would be a means for taking into account the variety of institutional settings and circumstances that characterize science shop practice today. Furthermore, one might explore the value of the developed framework for other institutional initiatives concerned with similar goals, be they more concerned with the promotion of collaborative research or with the promotion of critical formats of university education. With respect to initiatives aiming at collaborative research, the recent French funding scheme PICRI (Partenariat institutions-citoyens pour la recherche et l'innovation) might be a worthwhile object of study. The framework might equally serve for

analyzing those attempts of integrating science shop-like work into the mission of universities' technology and knowledge transfer offices. With respect to the educational aspect of science shop work, the framework might contribute to discussions about the introduction of critical approaches to (engineering) education at universities (Perez-Foguet and Lobera, 2008; Boni and Berjano, 2009; Luján López and López Cerezo, 1996; Schlierf, 2009).

This is certainly only a tentative outlook on possible lines of future inquiry on the basis of my research results. It is a collection of possible forms of putting into practice the very idea that I have suggested to be the democratic argument guiding science shop work: to be constructive through critique.

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APPENDICES

APPENDIX A - DTU SCIENCE SHOP

1. LIST OF INTERVIEWS

Nº	Interviewee	Description	Date	Place
I1	M.S.J.	Coordinator of the DTU Science Shop	11-10-07	Technical University of Denmark
I2			27-10-07	Technical University of Denmark
I3			19-12-08	Telephone
I4	S.B.	Research assistant in the DTU Science Shop, coordinator of the collaboration	17-09-2007	Technical University of Denmark
I5	E.H.	Member of the Board of Vanløse Grundejersammenslutning	7-09-2007	Vanløse Kulturhuset
I6			20-09-2007	Vanløse Kulturhuset
I7	E.H., B.A.	Members of the Board of Vanløse Grundejersammenslutning	2-11-2007	Vanløse Kulturhuset
I8	M.E.	Supervisor of the student's projects	13-09-2007	Technical University of Denmark
I9	A.G.	Student participating in the first project	19-09-2007	Technical University of Denmark
I10	M.F.	Student participating in the second project	10-10-2007	Technical University of Denmark
I11	J. B. J., S. M. A.	Center for Byudvikling, Finance Committee of the Copenhagen City Council	10-07-2008	Copenhagen City Council
I12	E.J.	Member of the Board of Copenhagen Carsharing	3-10-07	Agenda21 Center, Norrebro
I13	C.B.	Employee of the Danske Delebiler, the Danish carsharing umbrella organization, during the collaboration	21-09-07	Københavns Delebiler, Norrebro
I14	L.L.	Employee of Københavns Delebiler, the Copenhagen Carsharing during the	16-10-07	Technical University of Denmark

		collaboration		
I15	M.F.	Århus Delebilklub	30-10-07	Københavns Delebiler, Norrebro
I16	B.H.	Member of the DTU urban planning research unit	9-10-07	Technical University of Denmark
I17	M.E., S.B.N., M.S.J.	Members of the DTU urban planning research unit and the Science Shop coordinator	5-09-07	Technical University of Denmark

2. DOCUMENTS DTU SCIENCE SHOP

2.1. Schedule for the second project of the Vanløse collaboration resulting from the start-up meeting

TIDSPLAN FOR MIDTVEJSPROJEKTET
Byplanlægning i vanløse

Februar	Marts	April	Maj	Juni
Uge 7: Læse litteratur (teori og metode). Møde d. 16.: Lave tidsplan/ få overblik.	**Uge 10:** Læse litteratur (teori og metode). Skrive teori samt metodeafsnit. Til Vanløse d. 8: Se grunde (Ferring og Fenger) samt fotografere. Møde d. 9.: Lave oplæg for Erik, Jan og Bent.	**Uge 14:** Skrive (især på stedsanalysen). Møde: Udarbejdelse af forslag. Planlægning af interviews.	**Uge 18:** Udførelse af interviews. Udskrivning af interviews. Analyse af interviews.	**Uge 22:** Eksamenslæsning.
Uge 8: Læse litteratur (teori og metode). Se på Vanløsebasen. Møde med vejleder d. 23. Til Vanløse (aflyst pga. af vejret).	**Uge 11:** Læse litteratur (teori, metode og om stedsanalyse). Skrive teori samt metodeafsnit.	**Uge 15:** Træne i interviewteknik. Møde: Planlægning af interviews.	**Uge 19:** Udførelse af interviews. Udskrivning af interviews. Analyse af interviews. Revurdering af forslag.	**Uge 23:** **(Hele ugen)** Skrive rapport, evt. opsamling.
Uge 9: Læse litteratur (teori og metode). Begynde at skrive teori samt metodeafsnit. Til Vanløse (aflyst pga. af vejret).	**Uge 12:** **(Påskeferie)** Skrive, tænke evt. mødes.	**Uge 16:** Udførelse af interviews. Udskrivning af interviews.	**Uge 20:** **(Hele ugen)** Analyse af interviews. Revurdering af forslag.	**Uge 24:** **(Hele ugen)** Skrive rapport, evt. opsamling.
	Uge 13: Læse litteratur. Skrive plan- og strategiafsnit. Møde: Planlægning af interviews. Udarbejdelse af forslag.	**Uge 17:** Udførelse af interviews. Udskrivning af interviews.	**Uge 21:** Eksamenslæsning.	**Uge 25:** **(Hele ugen)** Gennemlæsning. Aflevering d. 24.

2.2. Article in DTU newspaper (Plougheld, 2006)

18

AF PLANLÆGNING TORE PLOUGHELD

Lokalplanlægning fra DTU giver øget borgerindflydelse

Studerende har lavet byplanlægning i Vanløse til gavn for borgerne

„De studerendes lokalplan er en hel lille Bibel for os. Den har i høj grad været med til at give Vanløses borgere en forstærket indflydelse på lokalplanlægningen i en tid, hvor vi diskuterer hvordan bymidten kan fornyes samtidig med at Vanløses provinspræg bevares."

Ordene kommer fra Erik Honoré, formand for Vanløse Grundejersammenslutning. Han har de seneste år sammen med sin forening via Videnskabsbutikken på DTU fået hjælp og nye idéer fra studerende på DTU til at udvikle små og store projekter som led i en ny samlet lokalplan for centrum af Vanløse, der skal gøre hele bymidten mere levende og attraktiv, men samtidig bevare Vanløses særpræg.

En række industrigrunde omlægges i disse år fra erhverv til boliger, parkeringspladser og nye udendørsarealer, og nye faciliteter til unge iværksættere og værested for idræts-udøvere af alle slags står også højt på ønskelisten. Så langt står et nyt kulturhus færdig, og to byggegrunde er tilbage. Og grundejerformanden i Vanløse er særdeles tilfreds med de foreløbige resultater.

Samarbejde gav gode værktøjer

„Som grundejere og borgere vil vi selvfølgelig gerne være med til at sætte et fingeraftryk på udviklingen i området. Men det er ofte svært at blive taget alvorligt af kommunen, fordi vi, der repræsenterer borgerne, ikke er eksperter, og det derfor godt kan komme temmelig luftige påstande og idéer frem. Men netop samarbejdet med de studerende på DTU har givet os nogle rigtig gode værktøjer til at håndtere byplanlægningen, og vi har næsten allerede nået mere, end vi drømte om."

Erik Honoré nævner det nye kulturhus som et konkret eksempel på et projekt, der blev udarbejdet af DTUs studerende på baggrund af borgernes ønsker, båret videre fra borgerne til politikerne og til sidst realiseret til et færdigt hus. Et nyt helsecenter, der skal samle en række læge- og sundhedsfunktioner under ét tag, på forslag fra DTU-studerende, er også blevet særdeles godt modtaget blandt de adspurgte borgere, fortæller Erik Honoré.

„Der vil altid være en svær balancegang mellem en bygherre, der skal tjene penge på sine projekter og så borgerne, der har en masse idéer til, hvordan man kan udnytte de forskellige arealer og bygninger. Men alene det, at DTUs lokalplansforslag har været med til at skabe diskussioner blandt borgerne selv og givet dem medindflydelse har været rigtig godt."

I det hele taget har borgerne været inddraget meget og er blevet spurgt i større og mindre undersøgelser i forbindelse med udarbejdelsen af de alternative lokalplaner. DTU's seneste rapport blev også offentliggjort i lokalpressen og gav anledning til mange gode diskussioner om fremtidens udformning af Vanløse centrum.

Realistisk midtvejsprojekt

Marie Sellebjerg Møller, Vibe Gry Nielsen og Mette Prehn de, der alle studerer polyteknik på DTU står bag den seneste lokalplan. Den blev udarbejdet over et helt semester, fra februar til juni 2005.

„Vi ville gerne lave et realistisk midtvejsprojekt, der involverede rigtige mennesker. Derfor var det spændende at deltage," fortæller Marie Sellebjerg Møller, der for nylig besøgte Vanløse for at se, hvad der var sket.

„Jeg blev meget overrasket over, at der er sket så meget. Det ser helt klart ud som om,

Sasser Brodersen fra DTU's Videnskabsbutik (tv.) sammen med grundejerformand Erik Honoré og studerende Mene Sallebjerg Møller (th.) på en af de tomme grunde ved Vanløse Station, der efter planen skal inddrages i byfornyelsesprojektet.

at flere af vores idéer er blevet brugt derude. Så det er fedt at se, at det, vi lavede for mere end et år siden, nu kan være til gavn for andre mennesker."

Eksporterer de gode erfaringer

Fra første januar 2007 deles København ind i 10 nye bydele, heriblandt Vanløse. Og Erik Honoré og hans grundejerforening arbejder allerede nu med at udbrede kendskabet om det positive samarbejde med DTU's studerende til andre bydele, bl.a. Brønshøj, som overvejer en lignende plan for deres bymidte.

Desuden har Vanløse Kommune nu sat 500.000 kr. af årligt til at fortsætte arbejdet med byplanlægningen i samarbejde med eksterne partnere, ligesom der er sat 1,8 mio. kr. af om året, som af lokaludvalget skal uddeles til nye initiativer inden for bl.a. idræt og kultur.

APPENDIX B - TALLER DE BARRIS

1. LIST OF INTERVIEWS / MEETINGS

Nº	Interviewee	Description	Date	Place
I18	J.A., M.C., S.A., K.S., A.B.	Members of the Taller de Barris	21-05-08	Velluters, Valencia
I19	D.P.	Member of the Taller de Barris	21-05-08	Telephone
I20	R.B, L.R.	Members of the neighborhood association El Palleter	7-09-09	Premises of the association El Palleter

2. DOCUMENTS

2.1. First draft of the Project

La mejora energética del barrio de Velluters

Objetivos:

1) La sensibilización de la población sobre la problemática energética y la difusión de soluciones tanto tecnológicas como no tecnológicas que contribuyen a la mejora de la calidad de vida de los vecinos, al ahorro energético y al fomento de la generación de energía a partir de fuentes de energía renovables.

2) Generar propuestas de mejora energética del barrio, dirigidas tanto al Ayuntamiento como a los vecinos, y la implantación de algunas de ellas como intervenciones de demostración.

3) Generar procesos de aprendizaje crítico en los participantes.

Metodología:

La metodología empleada tendrá dos pilares fundamentales: En cuanto a la disciplina técnica, servirá de fundamento la <u>arquitectura bioclimática</u>, y en cuanto al proceso de investigación que se basará en la <u>metodología de la investigación participativa</u>.

Visto desde la arquitectura bioclimática, cuyo objetivo es mejorar el rendimiento energético del parque de vivienda, se trata incidir tanto en <u>aspectos exteriores</u> a los edificios, que influyen en el microclima y en el soleado del edificio (la proporción área asfaltada/área con vegetación, el arboleado, …), como en <u>aspectos relativos al equipamiento y la estructura</u> material de los edificios (aislamiento, sombreamiento, …). La eficiencia energética de los edificios se mejora además mediante la introducción de instalaciones de energías renovables.

La metodología de la investigación participativa consistiría en la realización del proyecto en un esfuerzo coordinado entre los vecinos del barrio y el equipo universitario que a su vez estará compuesto de estudiantes y profesionales universitarios.

Actores:

Habrá un <u>equipo universitario/investigador</u> de la UPV, compuesto por alumnos y personal investigador, y un la asociación de vecinos de Velluters.

Actividades:

Las actividades se pueden agrupar en cuatro fases principales, que sin embargo pueden solaparse. Al final de cada fase, habrá un intercambio entre los socios europeos.

Fases:

1) Recogida de datos

2) Análisis de datos

3) Generación de propuestas e implantación de una selección con fines demostrativos

4) Informe final

- Recogida de datos

- Datos cuantitativos:

  o estudio bioclimático

  o cartografía

  o consumos (invierno / verano)

  o cambios estructurales en los últimos años

  o Estudio de iluminación

  o Plan general de ordenación urbana

  o Infraestructuras de transporte

  o Estadísticas (número de viviendas, uso rotacional, número de residentes, etc)

- Datos cualitativos:

  o cómo lo viven los vecinos

  o dónde ven los problemas

  o han notado cambios en los últimos años (por cambios estructurales o cambios económicos, nuevas tecnologías (aire acodincionado)…)

  o Cuantificación de las necesidades locales

- PUESTA EN COMÚN DE LOS RESULTADOS ENTRE LOS SOCIOS EUROPEOS -

- Análisis de datos

  • mediante software de cálculo energético de edificios: CALENER

  • mediante interpretación de datos de tipo económico y técnico

  • mediante software de cálculo de iluminación DIALUX

  • mediante software de generación de modelos 3D de la trama urbana

Esta actividad se llevará a cabo con la participación "guiada" de los vecinos con la supervisión de un coordinador.

- DEPENDERÁ DE CAPACIDADES TÉCNICAS DE SOCIOS: POSIBLE COIMPARACIÓN DE FUNCIONAMIENTO DE SOFTWARE DISTINTO… POSIBLE EL APOYO DESDE NUESTRA PARTE EN LA PARTE TÉCNICA??... –

- Generación de propuestas e implantación de una selección con fines demostrativos

El equipo universitario generará propuestas a partir de los resultados del análisis, que considerarán necesariamente la viabilidad técnica y económica y factores humanos (hábitos, disponibilidad de tiempo,…), y que incluirán consejos prácticos cómo llevar a cabo las propuestas, indicando empresas que pueden contratarse para ello, etc.

Los vecinos valorarán las propuestas. En caso de necesidad de cambios, las críticas de los vecinos se usan como realimentación para mejorar las propuestas. En caso de una valoración positiva, seleccionarán algunas propuestas para su implementación con fines demostrativos.

Los vecinos determinarán juntos con el equipo universitario los detalles de la implementación y la forma de usarlas para la difusión, buscando cuando posible cauces de difusión "de igual a igual", es decir de vecino a vecino o de alumno del colegio del barrio a otros alumnos, etc. De este modo, estas intervenciones de demostración servirán para la difusión más amplia de las propuestas.

- Evaluación e informe final

Se evaluará tanto el proceso como el aprendizaje de los actores implicados, es decir, de los alumnos, el personal investigador y los vecinos.

En cuanto a los alumnos pueden evaluarse aspectos del aprendizaje crítico como por ejemplo el aumento en el conocimiento de realidades sociales, la autonomía, la capacidad crítica, etc.

En cuanto a los vecinos, se evaluará tanto el aprendizaje sobre la problemática energética como la difusión de las propuestas mediante las intervenciones de demostración entre iguales.

La evaluación se llevará a cabo mediante cuestionario, entrevistas…? Será una evaluación cualitativa con gran peso en la autoevaluación.

La evaluación resultará en un informe preliminar, que se presentará en un taller en el para ser discutido entre los participantes. A partir del informe preliminar y los resultados de su discusión en el taller, se elaborará un informe final.

Participación de los distintos actores en cada actividad:

Actividad	Alumnos	Personal investigador	Vecinos
1- Recogida de datos	XX	X	XX
2 - Análisis de datos	XX	XX	¿?
3 - Generación de propuestas e implantación de intervenciones de demostración	XX	X	XX
4 – Evaluación e informes	X	XX	X

Resultados:

- Se habrán generado propuestas de acción para el Ayuntamiento local y para los vecinos del barrio. (Propuesta de un manual de urbanismo bioclimático para el barrio)191

- Se habrá elaborado un documento de difusión de los resultados (y del proceso y del aprendizaje)

- Se habrá generado un proceso de aprendizaje en profesionales y estudiantes universitarios y en los vecinos en un proyecto compartido.

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191 Enlace a un artículo resumen de una tesis doctoral: http://habitat.aq.upm.es/ub/

2.2. Results of the SWOT workshop:

DAFO Velluters "Taller de Ideas"

Sábado 10 de junio

RESULTADOS

"DEBILIDADES"

¿Cuáles son los problemas existentes o incipientes en el interior del barrio?

➔ Falta de aparcamiento (2)
➔ Solares abandonados / muchos solares / solares vacíos: suciedad, posibilidad de incendios, ratas, …
➔ Falta de cohesión social (insolidaridad) / falta de convivencia
➔ Drogas y prostitución y delincuencia (foco de marginalización) / droga / prostitución / prostitución, droga…: marginalidad / falta de seguridad nocturna / ocupación de fincas viejas
➔ (falta de respeto al vecindario)
➔ Pocos vecinos / vecinos que se van / faltan viviendas (hay demasiados solares) / población envejecida, no hay niños
➔ Política de vivienda poco transparente
➔ Construcción de baja calidad
➔ Desidia y falta de interés por Ayuntamiento / falta de servicios público / falta de servicios básicos: escuelas, salud, mayores
➔ Tráfico en las calles peatonales / apertura tráfico / densidad tráfico / tráfico y acumulación de vehículos en aceras y en puertas
➔ Contaminación atmosférica, acústica y visual
➔ Calles en mal estado
➔ Falta de verde / falta de zonas verdes
➔ Barrio cercado por edificios altos

"FORTALEZAS"

¿Cuáles son los elementos de valor del barrio (ambiental o social) que queremos fomentar o preservar?

➔ Muchos colectivos con sede en el barrio / existencia de instituciones y organizaciones que han vuelto al barrio (culturales, ONGs, …) / existencia de muchas asociaciones
➔ Asociación de vecinos con local / Gremio de carpintería / Conservatorio de música
➔ Residentes (vecinos que se movilizan)
➔ Participación (en asociaciones, etc)
➔ Calles peatonales (pero sin regular)
➔ Protección frente al tráfico
➔ Historia y edificios históricos / (fomentar y preservar) edificios culturales y profesionales / tradición cultural / tradición comercial
➔ Barrio histórico céntrico / situación del barrio (céntrico, favorece el comercio)

➔ Espacios públicos por aprovechar / barrio con posibilidades (espaciales) / gran cantidad de solares son suelo público
➔ Jardines existentes
➔ Biblioteca municipal

"AMENAZAS"

¿Cuáles son los factores externos que pueden empeorar la situación del barrio?

→ Poca calidad nueva construcción
→ Especulación solares / especulación / especulación y paso de lo público a manos privadas
→ Expropiación
→ Información dispersa y desinformación sobre vivienda
→ Urbanismo (Plan) falta de concreción política
→ Huida de vecinos antiguos
→ Regulación urbana de tráfico / apertura al tráfico
→ Destrucción de espacio público para aparcar
→ Planes de hostelería / peligro de zonas de ocio / locales de ocio indiscriminado
→ Prostitución y mafias incompatibles con otros usos del barrio / delincuencia menor (inmigración asociada a mafias) / drogas y prostitución (institucionalización) / mafias, fomento de la droga y prostitución / incertidumbre inmigración

"OPORTUNIDADES"

¿Cuáles son los elementos sociales o físicos no completamente aprovechados que, desarrollados correctamente, fomentarán un cambio positivo en el barrio?

→ Subvenciones
→ Variedad de oferta cultural
→ Recuperar su historia / el barrio tiene una trama urbana que favorece la creación de un núcleo artesanal y de comercio tradicional que mantiene el espíritu del centro histórico / recuperar artesanía y comercio
→ Regulación del tráfico para residentes, peatonalización
→ Rehabilitación de edificios en ruinas y aparcamientos para residentes / edificios vacíos / mucha vivienda vacía que se podría habitar (fomento del alquiler)
→ Vivienda para jóvenes
→ Existe suficiente suelo público para construir servicios públicos necesarios y VPO (infraestructuras sociales)
→ Que los edificios que se construyan sean de buena calidad
→ Espacios vacíos / espacios aprovechables (plaza, calles)
→ Posibilidades nuevos vecinos (barrio desde cero)
→ Mejorar la convivencia / mejorar convivencia y conocimiento entre vecinos / mejora de la convivencia en el barrio
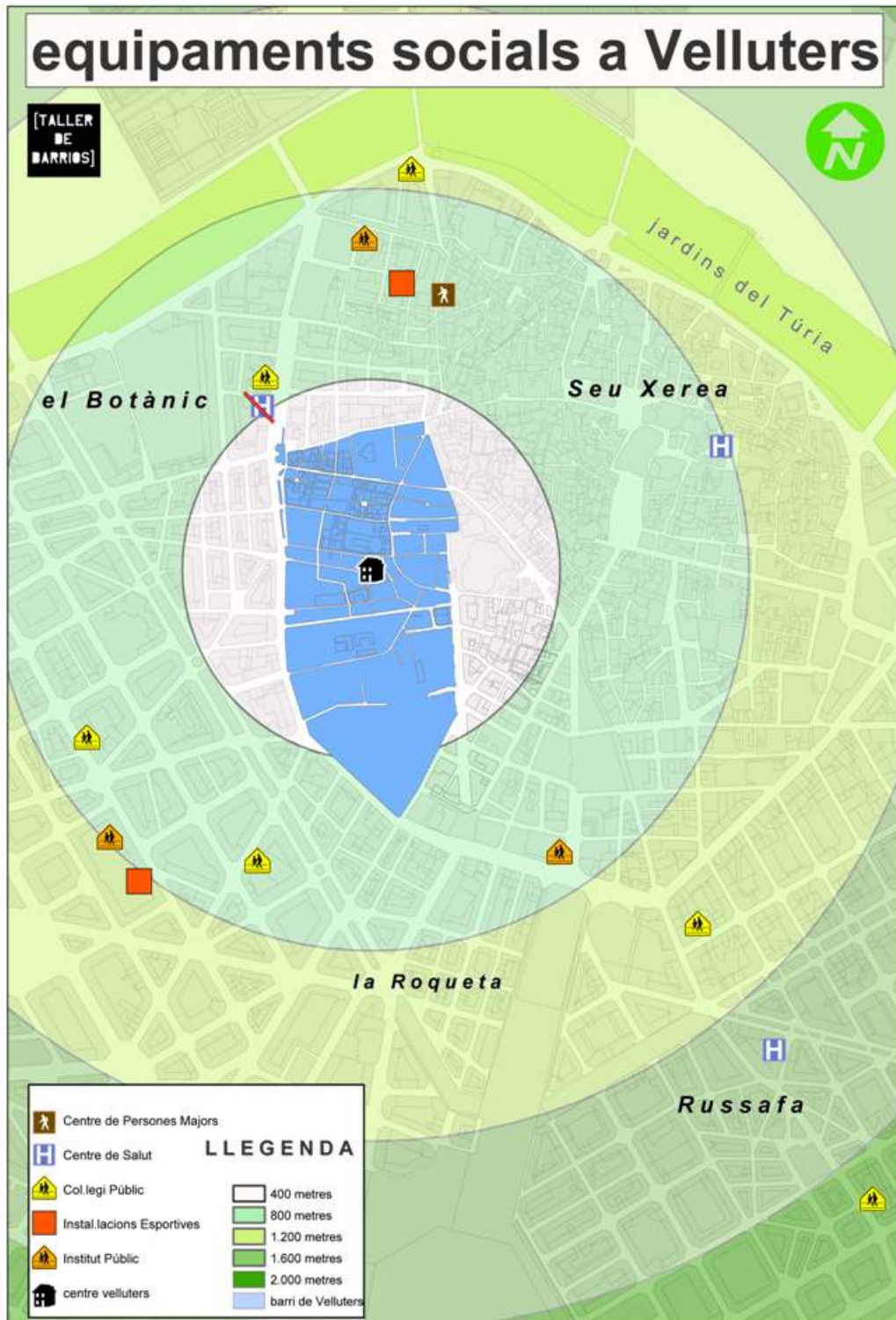→ Posibilidades del barrio

2.3. A version of the matrix crossing the SWOT results with the principles of bioclimatic urbanism
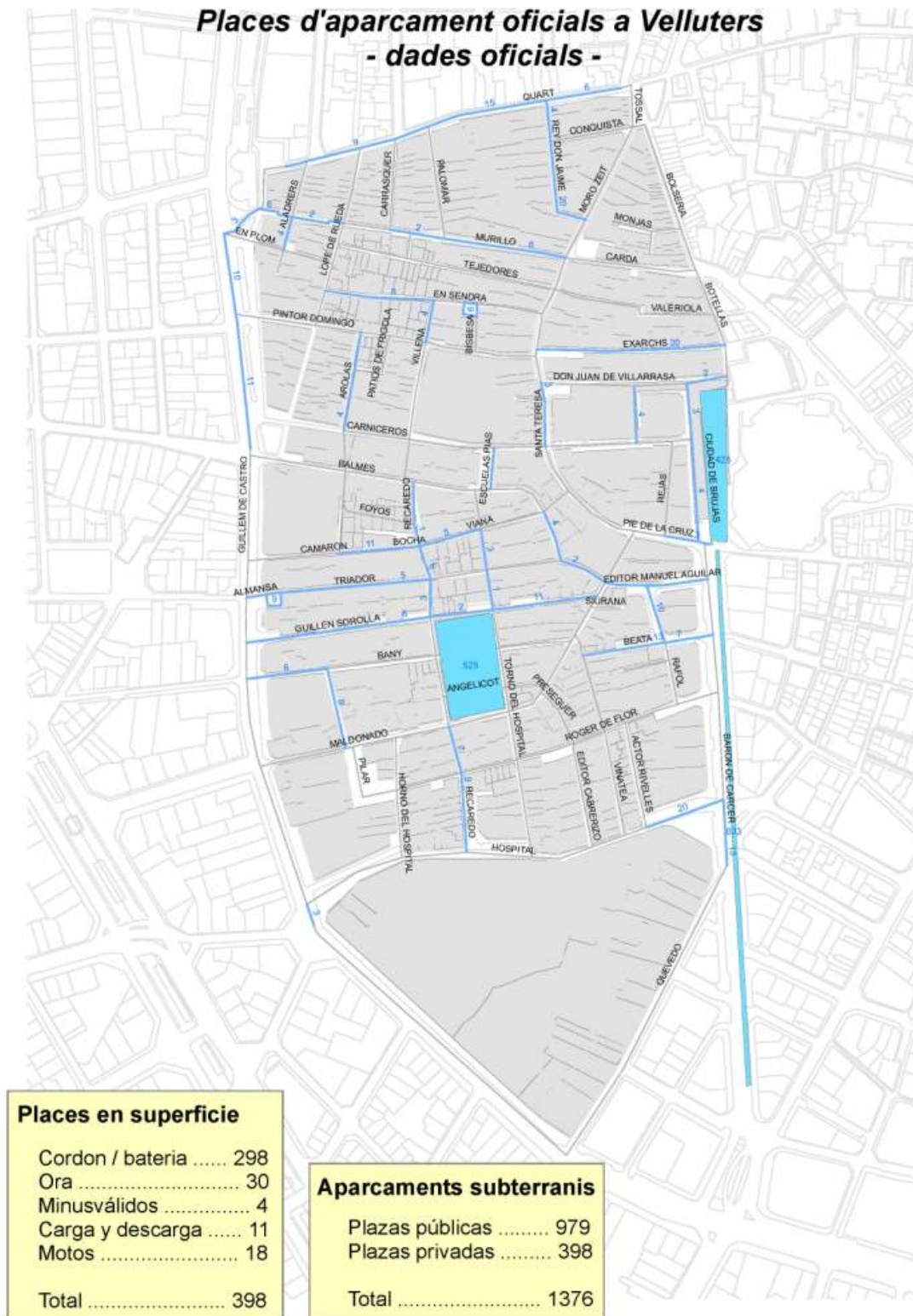
see extra sheet

2.4. Working document with categories and variables defined for the data gathering
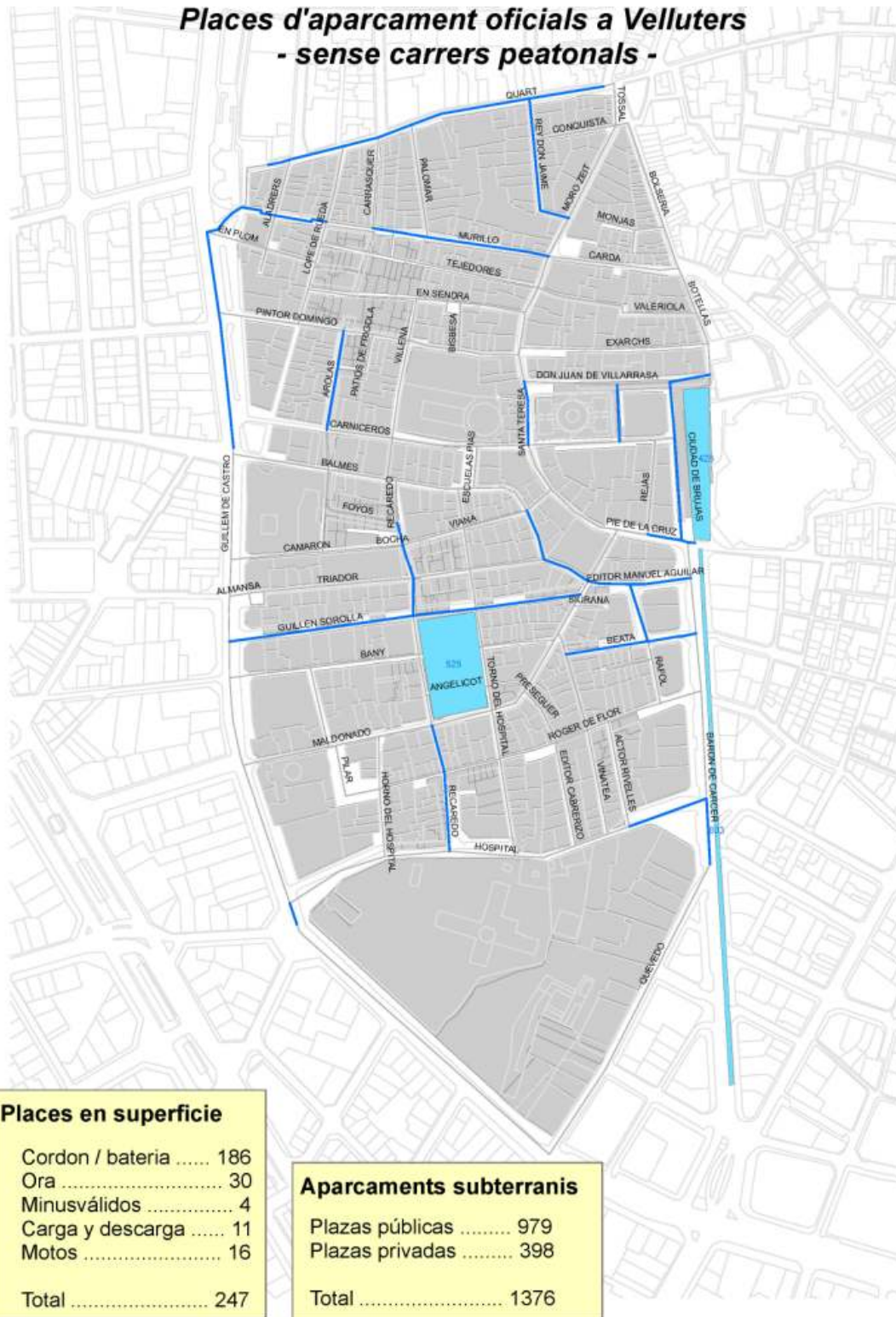
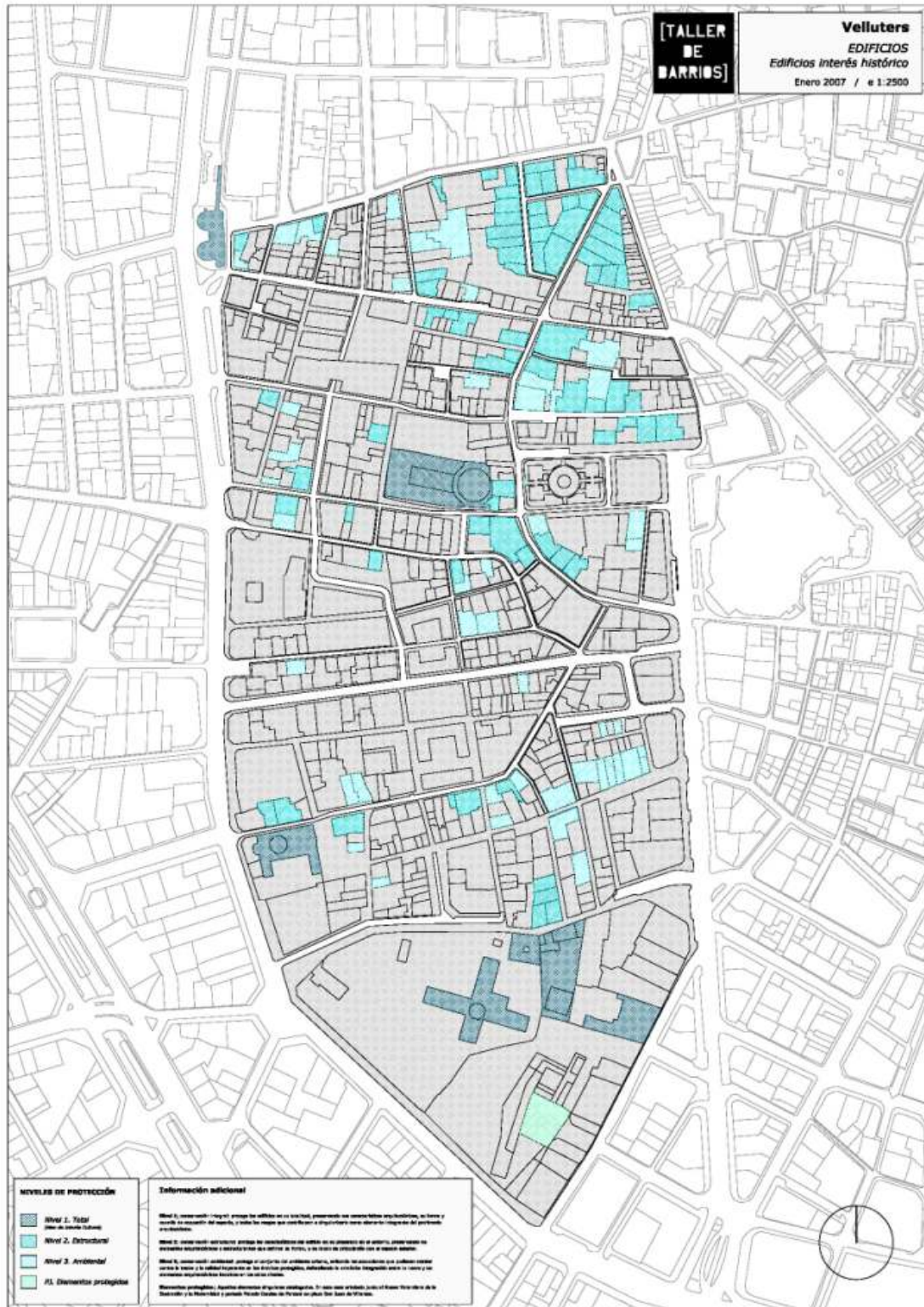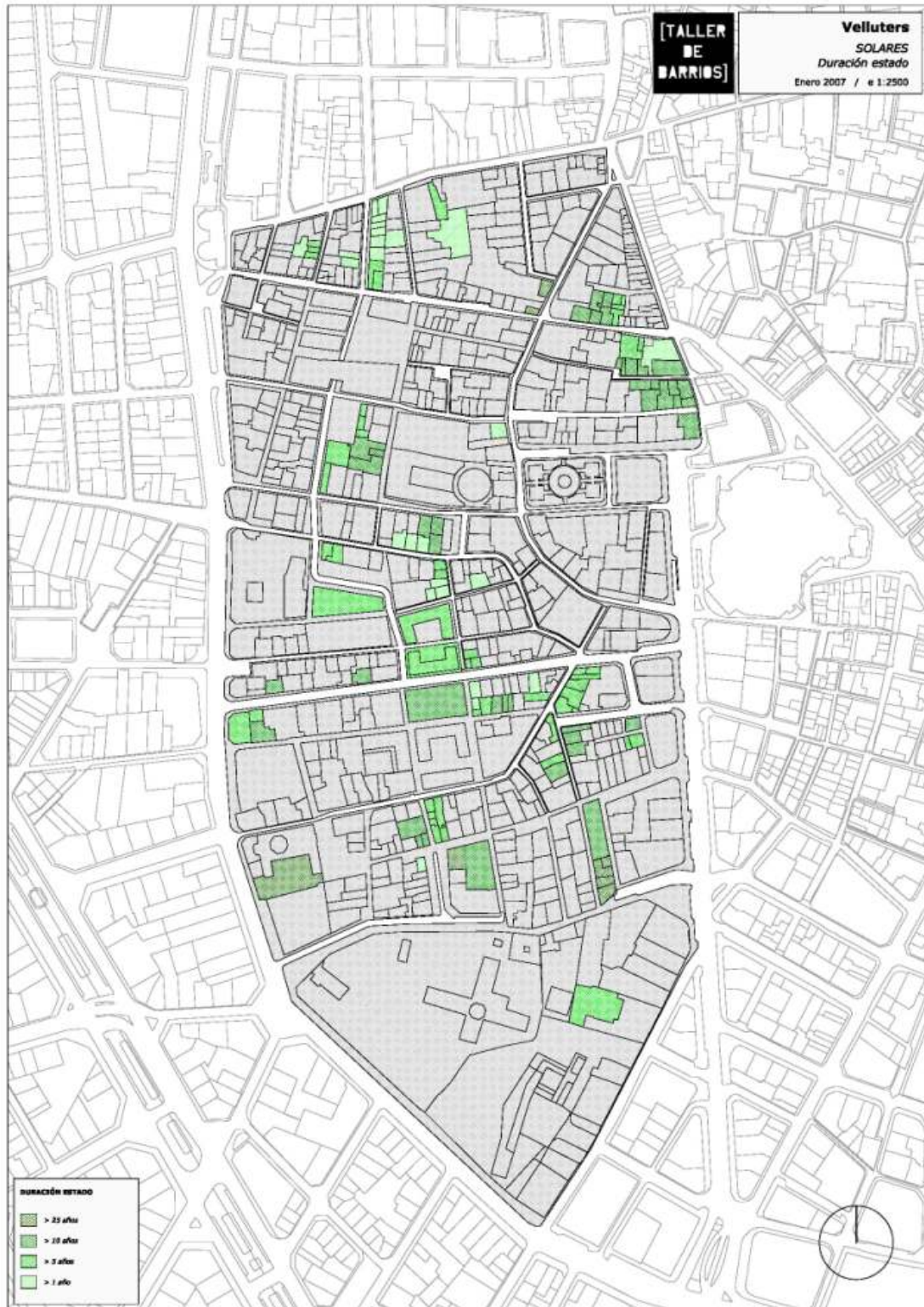| AREA	VARIABLE	COMENTARIS	GESTIÓN	TRABAJO
SOLARS	Identificació de la Propietat: public o privat		¿? Santi pregunta	X
	Destí segons PGOU	plànols de detall disponibles?	¿? Santi pregunta	Oficina
	Superficie (m2)		Ortofoto, anuario	Solares superficie A3.pdf
	Temps que ha sigut solar			Solares duracion A3.pdf
	"Estat del solar"			Campo
	Cates arqueològiques	si s'han fet, consulta a conselleria/Ajuntament...	Generalitat. Servei arqueològic	Oficina
TRÀNSIT	compatibilitat vehicle-peató	coparacions entre els plans oficials i la situació real		Oficina / Vecinos
	Peatonal/trànsit rodat		Josep	Oficina
	Densistat de trànsit			Oficina
	Aparcament al carrer	A diferenciar entre: Aparcable/aprcament públic(altura o baix superficie)/ús indebit(solars, boreres...)	Santi	Oficina
	Trànsit peatonal	medicions del aforo		Oficina
PROSTITUCIÓ	localització			Oficina
	intensitat per fraja horària			Oficina
	Associacions involucrades	Medicos del mundo, Villa Teresita, SOS Racisme	Asoc	Oficina
VIVENDA	Número VPOs		Generalitat / Ayuntamiento	Oficina
	localització VPOs		Generalitat / Ayuntamiento	Oficina
	Situació VPOs (? o vivenda en general)	en projecte/reals	Ver construidas, procesos	Oficina
	Data construcció (general o només VPOs ?)			¿?
	Estat del edifici	classificació segons 3 criteris: - DATA: Nova construcció/Rehabilitat/Antic - HABITABILITAT: buit/habitat - ESTAT: bo/dolent	Objetividad, ?	Campo
	Orientació Teulada	Tipo: Teulada (indicar orientació) /terrasa	Ortofoto (distinguir planas, inclinadas y orientación)	Oficina
	Nivell de Vivenda protegida	Identificar U2, U3....i/o segons criteris "nostres"		Edificios niveles de protección A3.pd
	Altura edificis			Catastro altura.zip
EDIFICIS (usos diversos)	Edificis de caràcter públic		Titularidad pública (Equipamientos)	Oficina
	Edificis d'ús combinat:	- residencial/públic - residencial/comercial (baixos)	Presencia pública (Parcial)	
	Edificis d'interés històric			Edificios niveles de protección A3.pd
CONTAMINACIÓ ACÚSTIC	Identificació de zones		Ayuntamiento	Oficina
	Causes	Trànsit/Activitat comercial/ oci		Vecinos
ZONA VERDA	Localització zones: reals/projectades			Oficina
	ús que es fa de la zona			Campo
ALTRES	dades demogràfiques del barri.		Anuario	Oficina

2.5. Map about the equipments in the district

2.6. A selection of further maps

Places d'aparcament oficials a Velluters
- dades oficials -

Places en superficie

Cordon / bateria 298
Ora 30
Minusválidos 4
Carga y descarga 11
Motos 18

Total 398

Aparcaments subterranis

Plazas públicas 979
Plazas privadas 398

Total 1376

Places d'aparcament oficials a Velluters
- sense carrers peatonals -

Places en superficie

Cordon / bateria 186
Ora 30
Minusválidos 4
Carga y descarga 11
Motos 16

Total 247

Aparcaments subterranis

Plazas públicas 979
Plazas privadas 398

Total 1376

Tràfic rodat i peatonalització a Velluters

Carrers peatonalitzats
i de tràfic rodat

carrers oficialment peatonals
carrers destinats al trànsit rodat

El·laboració pròpia. Any 2006

[TALLER DE BARRIOS]

Carrers "realment" peatonals a Velluters

Carrers peatonalitzats
carrers 100% peatonals
carrers amb tràfic rodat

El·laboració pròpia. Any 2007

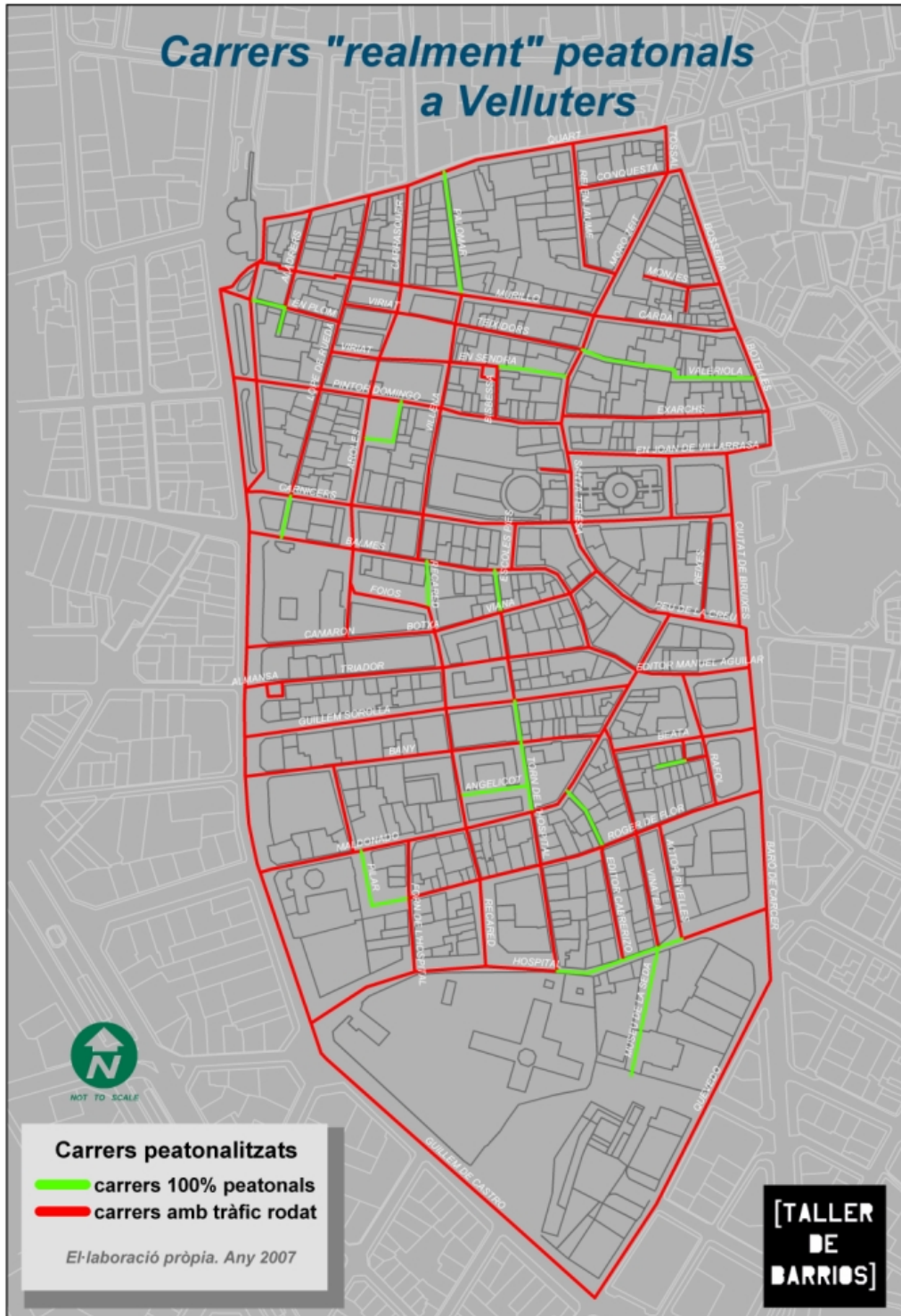[TALLER DE BARRIOS]

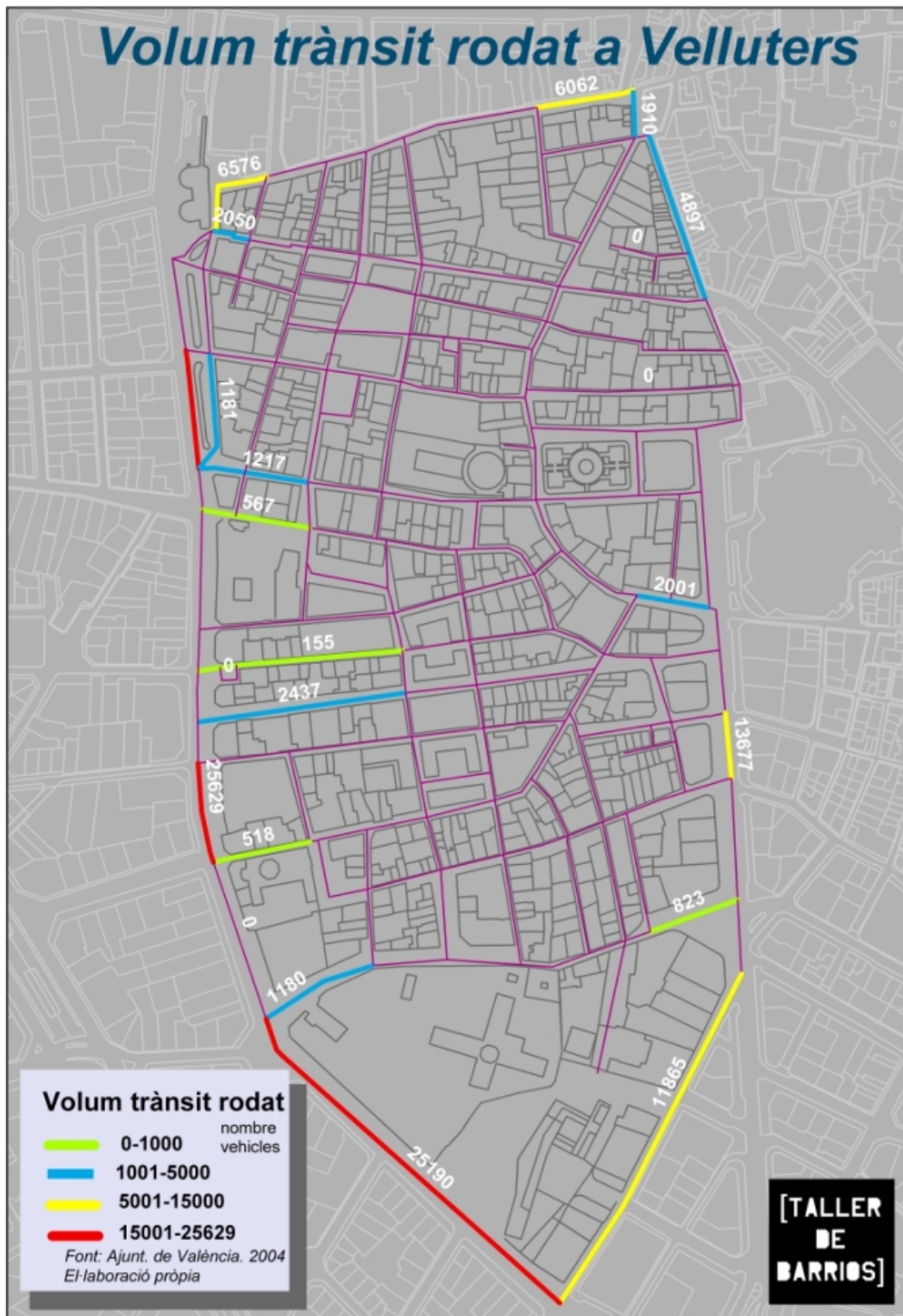Volum trànsit rodat a Velluters

2.7. Results from the second workshop

31-03-07
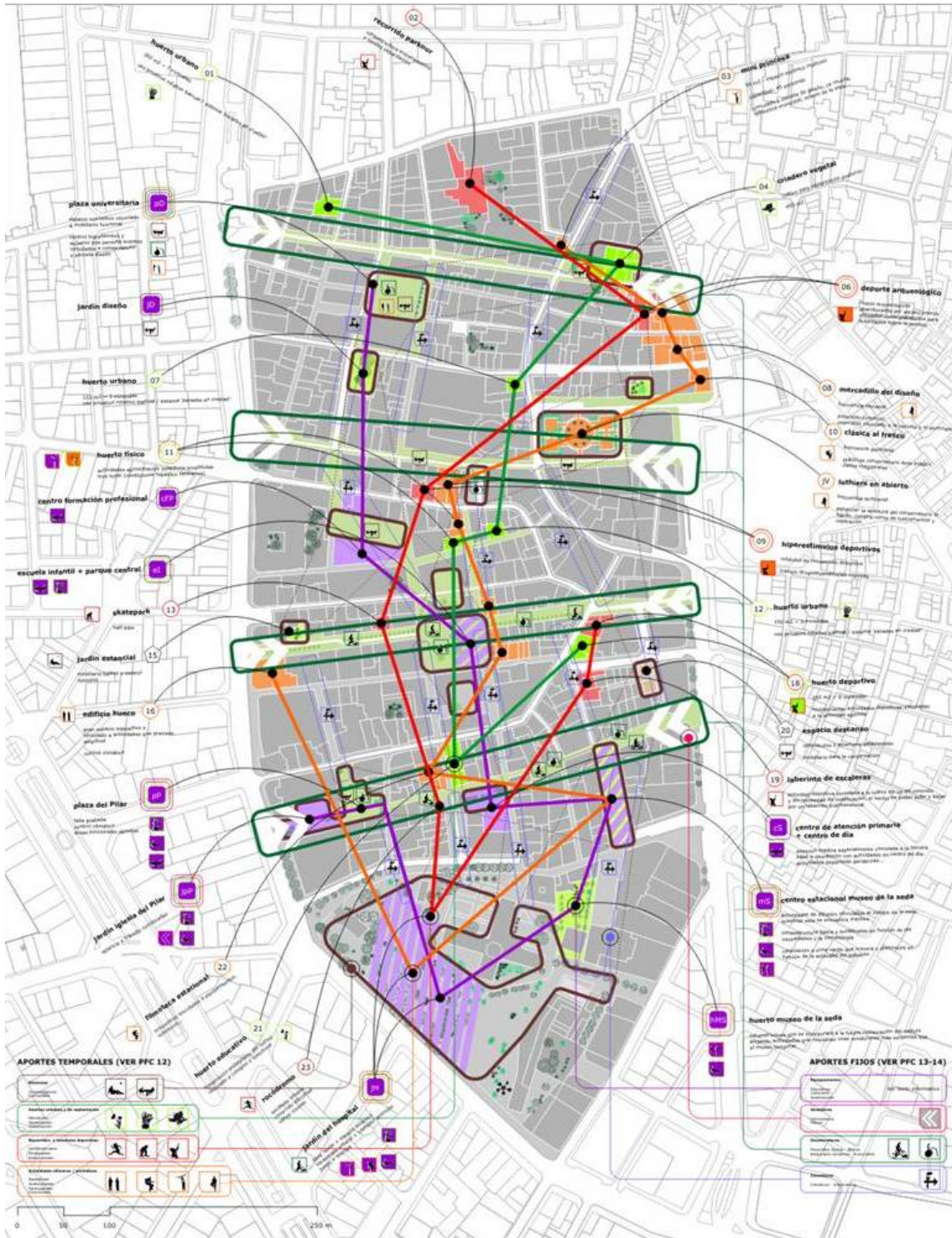
resultados / conclusiones taller2

espacios comunes

solares	parques, zonas verdes, huertos	contactos políticos, contacto/colab. con colectivos con problemas parecidos talleres (colegios y en general) elaborar propuesta turístico-lúdico-cultural (servicios, más comercio pequeño); hay ganas de ver verde
tejados	fotovoltaica, huertos	subvenciones
servicios	colegios, espacios deportivos	coordinarse con resto del barrio
residuos		recogida contenedores patios (hay contacto en el Ayuntamiento)
huerto en aparcamiento c/Vinatea		hacer propuesta
vida en la calle		realizar más actividades vecinos
difusión		exposición powerpoint actividades TB

tráfico / zonas peatonales

Difusión temas / implicación	actividades lúdicas
transporte alternativo: bici	información ya existente propuesta de trayectos piloto a colegios / biblioteca
Peatonalización <> aparcamientos	accesos restringidos / tarjeta residente propuestas globales calidad de transporte público influencia en el comercio mejorar accesibilidad espacios abiertos, de juego

2.8. Full-sized version of figure 4.7

2.9. Full-sized version of figure 4.8