

The importance of reflexivity in planning and design education

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This is a special edition of a Wageningen University Working Papers in Evolutionary Governance Theory (EGT). EGT offers a new perspective on the way markets, institutions and societies evolve together. It can be of use to anyone interested in market and public sector reform, development, public administration, politics and law. Theoretically, the approach draws on a wide array of sources: institutional & development economics, systems theories, post-structuralism, actor-network theories, discourse theory, planning theory and legal studies. In this working paper we use the EGT perspective to make an argument for greater reflexivity in planning and design education. Reflexivity is understood as a sustained reflection on the positionality of knowledge and presented as an opportunity to strengthen the academic dimension of planning and design curricula. The planning and design curricula, we argue, cannot tackle these issues without a deeper and more systematic self-reflection, a reflection on the disciplines, their teaching, on the role of planners and designers in society. We will show how research and outreach can play a transformative role in the development and delivery of professional landscape architecture and planning curricula. (see also www.governancetheory.com)

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I'll be your mirror. Reflect what you are, in case you don't know. I'll be the wind, the rain and the sunset. The light on your door to show that you're home
(Velvet Underground, 1967)

Introduction

Education in planning and design, as a broad field of related disciplines and professions, like landscape architecture, spatial planning, urban planning and design, and environmental governance encompasses scientific and practical dimensions (Van Assche et al., 2013, Goldstein and Carmin, 2006; Friedmann, 1996). Most of the educational programs in Europe and the United States focus on training students aiming to actually work in planning and design practices. Yet, the nature of those practices and by extension those of the related disciplines, has been questioned continuously (Sandercock, 1997). In landscape architecture, there is the eternal debate on design, at the crossroads of art and science (Van Assche et al., 2013, Gunder, 2011, Bannister, 1947, Hunt, 2002, Swaffield, 2002, Blake, 1999). In planning the quest for rational steering and control have become object of severe criticism (Van Assche and Verschraegen, 2008, Allmendinger, 2002, Flyvbjerg, 1998, Gunder and Hillier, 2010, Beunen et al., 2009). These issues are reflected in the development and organization of curricula. Each planning or design program can be interpreted as a set of negotiated positions in on-going debates on the nature of planning and design and a perspective on the role of these disciplines in society.

The past decades brought major changes in planning and design practices as well as in the scientific reflection on these practices (Van Assche et al., 2014). There is overall tendency in which planning and design processes are organized with more attention to participation and deliberation (Bevir, 2004; Beunen and Opdam, 2011; Mannigel, 2008; Fischer, 2009; Van Assche et al., 2011b). These shifts in governance are strongly intertwined with the contemporary debates about the role of science and expertise in society and the shift noticeable here (Beunen et al., 2012; Herrnstein-Smith, 2005 Fischer, 2000; McNie, 2007; Ellis and Waterton, 2005; Duineveld, 2008). Within the planning and design disciplines, the positivist belief in objective, value free knowledge enabling governmental actors to steer spatial organization, is gradually replaced by approaches in which planning and design processes and practices themselves have become objects of scientific investigation (Van Assche et al., 2012b; Flyvbjerg and Richardson, 2002; Flyvbjerg, 2002; Hillier, 2002; Allmendinger, 2001; Fischer, 2000; Duineveld et al., 2013; Nowotny et al., 2001). These changes bring along particular challenges for those who have to formulate curricula and courses in these disciplines. They should find ways to accommodate the new insights, and try to envision the consequences for the training of future practitioners. The reasons to change curricula are not limited to profession and discipline-specific transitions. One of the most important challenges is that curricula increasingly need to meet standardized

academic criteria, without getting totally detached from planning and design practice (cf. Keeling, 2006; Lock and Lorenz, 2007).

We argue that planning and design cannot tackle these issues without a deeper and more systematic self-reflection, a reflection on the disciplines, their teaching approaches, and on the role of planners and designers in society. In this paper we will show how research and outreach can play a transformative role in the development and delivery of planning and design curricula. Education, we argue, can be a primary site of rejuvenation of the disciplines. In order to confront the issues at hand, the disciplines will have to rethink a number of relationships, and reflexivity can be a powerful tool in this endeavour. A stronger focus on reflexivity in planning and design education is desirable because this can contribute to the sharper delineation of art, science, and mere accepted practice. Reflexivity, in other words, we deem essential in a remaking of planning and design, that can increase the innovative capacity and adaptive potential of both disciplines and professions.

In the next section we first elaborate on the concept of reflexivity. This will be followed by a section in which we elaborate on the role of education in the fields of planning and design and related fields and discuss the reciprocal relations between research, practice and education. Drawing upon these insights we refine our analysis of the virtues of reflexivity in planning and design education.

Reflexivity

Our definition and use of reflexivity derives from several sources. There is the French post-structuralist tradition of Pierre Bourdieu (Bourdieu and Wacquant, 1992, Bourdieu, 2003), Michel Foucault (Foucault, 1994, Foucault, 1973) and Roland Barthes (Barthes, 1957). And we borrow from the sustained reflection on the role of the researcher in knowledge creation that took place in anthropology since the seventies (Geertz, 1973, Inglis and Geertz, 2000, Denzin, 1997, cf. Mauthner and Doucet, 2003). We complement this perspective with notions derived from social systems theory, notably in the version of Niklas Luhmann (Luhmann, 1995, Luhmann, 1993, cf. Fuchs, 2001).

In various books, articles and lectures Bourdieu urged for a sociology and anthropology that duplicates its scientific labour, one that not only objectifies the social reality of others but also the researcher, the research and the discipline in which the research takes place (Bourdieu and Wacquant, 1992, Reed-Danahay, 2005, Bourdieu, 2003). For Bourdieu reflexivity is 'the objectivation of the subject of objectivation (...). What needs to be objectivized, then, is not the anthropologist [or sociologist] performing the anthropological [or sociological] analysis of a foreign world, but the social world that has made both the anthropologist [or sociologist] and the conscious or un-conscious anthropology that she (or he) engages' (Bourdieu, 2003). Bourdieu, leaning on Foucault and Barthes,

identifies reflexivity to a large extent with the uncovering of latent assumptions, with 'the systematic uncovering of unthought, intuitive, embodied categories which themselves are preconditions of conscious practice' (Howe and Langdon, 2002). He argued that researchers must always reflect critically on the effects of their choices, actions, and interests. This can be extended to practitioners, more so in planning and design disciplines, since these disciplines embody collective choices and collective investments in the future in which these practitioners play an important role. Their role in decision-making, and the positionality of their knowledge and skills, shapes in a fundamental manner the organization of space, and the options left open for the future (Van Assche et al., 2013; Howe and Langdon, 2002).

Whereas Bourdieu put emphasis on the need for reflexivity, Luhmann's work offers some valuable insights for understanding the functioning of reflexivity. His work focuses on the communicative processes that shape historically contingent social practices, which he called social systems (Luhmann, 2012; Luhmann, 1995; Teubner, 1989). All social systems are self-referential, which implies that they internally produce a construction of the outside world in terms of unique basic distinctions, concepts and procedures and that they recursively produce their communications from the network of their own communications (Teubner, 1989). Luhmann distinguishes three types of social systems: interactions, organisations and function systems. Interactions are conversations, implying the perceived physical presence of interlocutors. They are short-lived systems, fleeting, and limited in their processing of environmental complexity (Luhmann, 1995). Organisations reproduce themselves through a specific form of communications, namely decisions, implying the awareness and communication of alternatives, and continuously referring to previous decisions (Seidl, 2005). Function systems are the systems of communication that fulfil a specific function in society at large. Law, economy, politics, religion, science and education are examples of function systems that each play a role in the reproduction of society as the encompassing social system.

For Luhmann, reflexivity is self-reference, and he distinguishes three types of self-reference (Seidl, 2005). There is the self-reference that is constitutive of any communication: communication can only function by referring to previous communications. This form of reflexivity can be unconscious or unintentional. Paradoxically as it may sound, it is a non-reflexive form of reflexivity, unaware of the self-referential character of communication. Secondly, there is communication about communication: how did we communicate, how can we communicate better? This is a form of reflexivity, which is reflexive about its own reflexivity: the communications within a social system are deliberately observed by the social system itself. Thirdly there is communication on the position of social systems (a self-referring set of communications) vis a vis their environments. The environment of social systems is the world at large, including other social systems. In case of planning and design education, which can be seen as subsystems of the educational system, those environments include

for example professional organizations, businesses, and the function systems of politics, law, art and science. Here the social system is reflexive about itself in relation to the environment and other social systems in the environment.

In terms used by Luhmann (Luhmann, 1993; Luhmann, 2000; Fuchs, 2001), communication about communication and communication on the position of social systems requires second order observation. This is not a higher or better order of observing; it is just the observation of observations. It is the observation of observing systems, which can be actors, groups or networks. It analyses the ways these observing systems delineate one object from another, the distinctions that they make, the preconditions for these distinctions, the ways they define themselves, the semantics that are used, the procedures, the images of relevant environments at their disposal, et cetera. Second order observations therewith observe how is observed in a first order observation and more importantly it observes the conditions under which the first order observation is possible.

Second order observation, as a deliberate attempt to foreground the conditions under which knowledge is produced, makes it possible to empirically underscore the *positionality of knowledge* (Bal, 2002, Adams, 1999), which means that knowledge is always a contextual construction. It is produced in a series of contexts, and the conditions of creation leave marks that cannot be erased entirely later (Van Assche, 2007, Latour and Woolgar, 1986). For education, dealing with the transfer of knowledge and skills in society, this positionality has important consequences. In the next section we first present our perspective on planning and design education, after which we will elaborate on these consequences.

The myriad of planning and design

If the primary role of planning and design education is to prepare students to work as landscape architects, planners, landscapers, urbanists and so on, what does that mean for education? What do students need to know? Which competences and skills do they need to learn? Planning and design exists in many variations, shapes and forms (Van Assche et al., 2013, Allmendinger, 2002). Different countries, even regions, have different planning and design traditions, different commonplace notions of the professions and their practitioners (Van Assche et al., 2013, Van Assche et al., 2010). Universities have their own take, and even within the same university, a planning and a design department might have radically different views on what planners and architects are, what they do, and what they are supposed to do. There is no unambiguous description of planning and design. Both planning and design encompass a myriad of disciplines that address various aspects of spatial organization and in which landscape architects and planners are attributed different roles. Educational programs are often based on a historically grown, specific and idealized perspective on the

role of landscape architects and spatial planners in practice (Van Assche et al., 2010; Allmendinger, 2001). It is therefore useful to reflect upon the different perspectives on planning and design, before we relate these different perspectives to planning and design education.

Various authors have elaborated on planning and design and the specific position of different disciplines like landscape architecture, architecture and urban design in relation to each other (Gunder, 2011, Steiner, 2011 Childs, 2010, Madanipour, 2006). One can see design as an aspect of planning (e.g. Gunder, 2011), and one can emphasize the professional and disciplinary boundaries of the design disciplines, stressing their difference, possibly looking for essences of the disciplines and professions. Most authors agree that planning and design share a common ground in shaping and governing spaces, that it is important to take into account normative goals of achieving economic, social, and environmental public good, and that design should go beyond merely aesthetic issues. Essences of disciplines and professions do not exist. Practices, professions, and the scientific reflection on them are the product of series of power/ knowledge transformations. They are contingent results of histories marked by (identity) politics, competition, adaptation, routines of repetition and habits of innovation (Fuchs, 2001, Seabright, 2010, Duineveld et al., 2009). Naming practices is part and parcel of this evolution: it cannot be extricated from this environment of competing and evolving identities (Bal, 2002). Names of disciplines and professions can therefore not be linked to presumably essential pursuits and each application of a disciplinary name to a certain situation ('This is a true urban design') or to an organization ('Department of urban design') should be analysed, by means of second order observing, against prevailing power/ knowledge configurations.

Drawing upon these insights we can make two important distinctions, which are often only implicitly separated, leading to all kinds of confusions. First we can *distinguish between professions and disciplines*. On the one hand we have the group active in planning and/or design practices under those labels and on the other hand the scientific community reflecting on, and possibly furthering, these practices. Secondly we *distinguish between disciplines and perspectives*. Perspectives are theoretical constructs based upon observations of the practices and reflections bearing various labels (architecture, landscape architecture, urban design, rural design, planning, ...).

Different design ideologies do play a role the dynamic position of design in the planning system (Gunder, 2011). Each community has its own planning system and the development of large, centralized and bureaucratic states since the renaissance in Europe, brought at least part of the planning system under supervision of the state (Scott, 1998; Hillier, 2002). When those states became more democratic, the planning system followed, to various degrees and at various speeds (Flyvbjerg, 1998). Communities and their institutions evolve and so does planning. The planning system changes over time and this means that different players will crystallize that in turn shape the future interactions in and of the planning system (Van Assche et al., 2010). The planning system and its pattern of

organizations, rules and actors is marked by strong path- dependencies, but these never entirely halt the evolution of the system (Chettiparamb, 2006; Van Assche et al., 2011a). Once certain actors or a certain perspective are in place, such configuration tends to reproduce itself (Seidl, 2005; Luhmann, 1995).

Planning and design, as disciplines and (self- conscious and self- labelled) professions have different histories. Planning in this sense is a product of the 20th century (Allmendinger, 2002; Platt, 2004), while design (first architecture) is self- identified at least since ancient Greek times. Planning and design perspectives, as defined above, are bound to be much older, as their emergence can plausibly be linked to Neolithic city formation, or the Neolithic revolution itself. Villages, agricultural land use, trade, and cities required specialization, role formation, diversification of land use, and much higher levels of spatial coordination (Seabright, 2010; Luhmann, 1995).

The perfect planning system does not exist. We would go further, and say that it cannot exist. A number of reasons has been treated extensively in the planning literature already: planning always creates losers, it cannot be fully inclusive, it is driven by volatile political and economic games and unpredictable citizen preferences (Hillier, 2002; Madanipour et al., 2001; Gunder, 2010). Citizens can be charmed, or blinded, by a certain approach which is then institutionalized without thoroughly discussing the drawbacks or without putting in place the structures and incentives to generate debate and adaptation -rules to change the rules (Garde, 2004). Such is a recipe for rigidity and in time, for disaster.

While a planning perspective, in our definition, entails an image of the place, and the presence of that image in decision- making makes it easier to recombine interests, assets and problems, a design perspective is marked by continuously entertaining the possibility to manipulate these images of place (and physical space further down the line). According to Sternberg (Sternberg, 2000: 266), urban design is the “manipulation of the concrete elements of distance, material, scale, view, vegetation, land area, water features, road alignment, building style.”

Planning and design perspectives thus overlap. Manipulation of place images can be experimentation, followed by evaluation (cf. Lynch, 1981), in terms of the goals of players, of perceived community interests, and in terms of problems and qualities. We argue that the give- and-take that is necessarily a part of planning, can generate more solutions and assets when the design perspective is never left, i.e. when it accompanies spatial decision- making, instead of finishing it, as part of ‘implementation’.

Planning-as-design, then, envisions the spatial referent from the beginning, reflects on its malleability, and generates design options every step of the process. The more complex the image of the place, the more variety in design options, and the better the implications of planning decisions can be envisioned. Planning focusing on procedures cannot be spatial design; planning focusing on

content could be. Design can leave the domain of planning, entering decision spaces where few actors are involved in spatial interventions. Or when manipulation of the space hardens early in the planning process, or dramatically reinterprets planning outcomes at the end. One can think of a garden design, with one person taking decisions on what comes where, and one can even imagine the design of larger areas where just one designer and a willing patron are deciding.

Planning and design education

Planning and design education are often characterised by a strong link with the professions. Even though a strong focus on the practice of landscape architecture and planning under current conditions seems to hold a promise of making students more easily employable, this strong focus on practical training is also regarded as an important reason why planning and design curricula often face critics for its supposed 'lack of scientific grounding' (Goldstein and Carmin, 2006). We believe students should not be relegated to the realm of reproduction of current practices, but should be enabled to reflect on these practices and contribute to their evolution (cf. Binder and Boldero, 2012; Poxon, 2001; Woerkum et al., 2007). Such evolution, we argue, is necessary to deal with the complexity of contemporary issues that society is facing. Planning and design can be important tools here, but only if theory and methodology can be adapted to the on-going changing environment in which they will be applied. This requires a continuous reflection on both the environment as well as on the role and position of planning and design in a society. Reflexivity can spur innovation, and proactive adaptation to changing environments, by bringing to light the nature and position of knowledge and skills routinely reproduced in the disciplines and professions. It seems evident that education plays a pivotal role.

In the previous section we have shown that planning and design can entail many things and that it is useful to distinguish *professions*, *disciplines* and *perspectives*. These distinctions are reflected in planning and design education, where a certain perspective upon planning and design disciplines and professions and upon the position of planning and design in society are translated into a curriculum and specific courses. The curriculum is likely to represent a certain perspective on planning and design, a certain ideology (Gunder, 2004). In order to gain a further insight in the differences in curricula and the place of reflexivity in education, we distinguish between content and process on the one hand and between reflection and activity on the other (Figure 1).

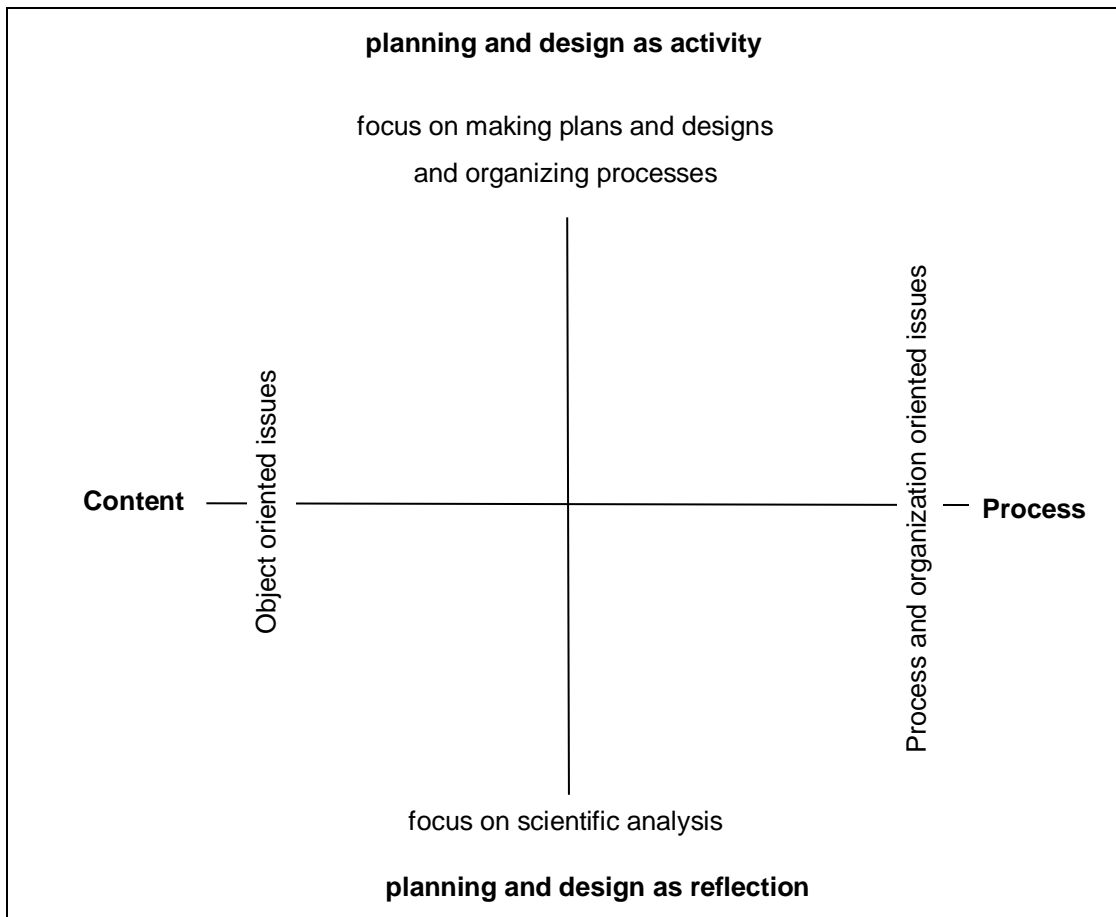


Figure 1. The different dimensions of planning education.

In planning and design curricula students are taught to (re)design space, to develop policies, plans and to design, and to organize planning and design processes. Students learn to analyse landscapes and spatial developments, to comprehend differing spatial claims, and to generate alternative solutions. These aspects of planning and design education are strongly orientated towards the professions and take in technical, methodical and ethical aspects. It is about making better plans, finding sustainable solutions and pursuing more democratic decision making processes, either focusing on improving the content of planning and design (technical aspects and design), or on the improvement of the planning or design process, purportedly leading to better plans (cf. Alexander, 2001). Both of those orientations can be referred to as activity.

Academic curricula also teach students to reflect on the planning and design practices and on the methods, knowledge and skills applied. Reflection is a key aspect of academic planning and design education. Students should learn how to scrutinize planning and design practices, to reflect on the role of organizations and institutions, and to understand the power/knowledge configuration in which objects, subject and perspectives are produced and reproduced (Van Assche et al., 2011b; Duineveld and Van Assche, 2011). Students can be taught to reflect on both content and process of planning and design. Furthermore they should also learn to be critical towards their own role and

position and how these influence their work and the potential outcomes of this work. This reflexivity can fuel and deepen debates about trends, deadlocks, drives and innovation. More in general, a thorough understanding of the positionality of all the knowledge and skills involved in planning and design can deepen the understanding of the desirable context- specific application of knowledge and skills and it creates the conditions for innovation and adaptation.

Schön has already observed that reflection and action are thoroughly intertwined. Practitioners 'reflect in action' and can be regarded as reflective practitioners (Schön, 1987; Schön, 1983). Yet, in education, both the action and reflection dimension require specific, and sometimes different, attitudes, skills and knowledge. Planning and design as activities require knowledge and skills related to the content and the process of planning and design. This includes knowledge about the landscape and the different land use activities, like infrastructure, agriculture, housing, leisure, water management and ecology. This knowledge is often slanted towards natural sciences and regularly dominates decision- making, therewith marginalizing other perspectives and forms of knowledge (cf. Flyvbjerg, 2002; Fischer, 2000; Fischer, 1990). Students should therefore be aware of the mechanisms that influence the construction and application of knowledge and the social and political consequences these mechanisms could have in society (Foucault, 2003; Scott, 1998; Jacobs, 1961). Action- oriented knowledge and skills related to the planning and design processes include methods, techniques and instruments. They also include knowledge of the relevant institutions, and the organizations and actors involved (Van Assche et al., 2012a; Van Dijk and Beunen, 2009). Furthermore, a broadly conceived familiarity is required with politics, power, communication, interpretation and organization.

The requirement of reflexivity directs the educator's attention to new sets of theories and skills. Students should learn to make planning and design practices object of reflection and develop the skills to reflect on their own role and position within the field. Teaching reflexivity requires the integration of a different set of skills and conceptual frames into the curriculum. Students need to learn theories and concepts that can be used to scrutinize planning and design practices. These include theories about the knowledge-action nexus, which can be derived from disciplines like cultural geography, anthropology, and science and technology studies.

An anatomy of reflexivity in planning and design education

In the following paragraphs, we refine our concept of reflexivity, while relating it to planning and design education. Bourdieu advocates reflexivity, which aims to unveil and unravel the rules, assumptions, discourses and contexts that form a scientific field or discipline, constituting the scientific practices of academics operating within them (Bourdieu and Wacquant, 1992). These structures enable the production of knowledge and simultaneously create blind spots within a discipline (cf.

Van Assche and Verschraegen, 2008). Reflexivity however, can include more than the uncovering of assumptions in the own reasoning. Planning and design education can teach students to reflect on methods applied, knowledge received, but such reflection can gain value by framing it in a more general consideration of the role of planning and landscape architecture in society (Luhmann's third form of self-reference). We can distinguish several types of reflection to be encouraged in this regard, each focusing on one relationship with the different function systems constitutive for the functioning of planning and design disciplines in society. We will treat the following function systems: education, politics, law, economy, art, and science and highlight the role of reflexivity for planning and design.

The function of *education* is to transfer knowledge and to spur innovation. Reflection in this perspective can be seen as the communication on teaching methods (Luhmann, 1995). The teaching of planning and design will have to reflect on itself, not only in terms of content that has to be communicated, but also in terms of effective ways to do this. Teaching methods and course forms will have to evolve together with changing ideas on what has to be taught, e.g. changing ideas on the role of reflexivity in practice. Reflection then also includes a consideration of the potential and limits of the educational system to transform society. If certain precepts in planning and design will never be implemented, because education cannot influence the organizations of practitioners, or because those practitioners are structurally marginalized in a certain configuration of law, politics, economy, this should be communicated to the students, who then can decide for themselves how much they want to identify with the activists role of planning and design.

Politics is the sphere of society that deals with the distribution of power and the taking of collectively binding decisions (Luhmann, 1990). Reflection on the political embedding of planning and design education can entail reflection on the current position of planning and design in reproducing the existing distribution of power (cf. Flyvbjerg, 2002), and reflection on the possibilities to alter that distribution by means of planning and design practice, or research. It can also entail reflection on the role of politics as such, on the power of the political system to steer society, in general and by means of spatial policies. In line the *legal* embeddings of planning and design can be scrutinized, which can include reflection on the constitutional limits and possibilities of planning and design interventions and policies (Van Assche and Verschraegen, 2008; Luhmann, 2004). Certain designs, policies and plans, but also certain processes, will confront legal constraints more quickly than others, while the power of landscape architects, urbanists or planners to change the legal frames is usually limited. Moreover, the reflection on political embeddings will have produced insights on the desirable role of citizens in planning and design, and consequently, on desirable limits to the power of planners and designers in shaping the rules for spatial organization. Just like in the other forms of reflection, comparative approaches can be helpful, unveiling different relations between the disciplines of spatial

organization on the one hand and legal systems on the other, thereby revealing the contingency of any specific configuration.

The *economy* is the sphere of society that deals with the distribution of wealth, expressed in the distribution of financial resources. Reflection on the economic embedding of planning and design education can be the reflection on the economic underpinnings of the present system of spatial organization, as well as the economic aspects of planning and design education. Certain skills are more expensive to acquire, certain pedagogical forms are more expensive, certain educational institutions are more expensive than others, while certain skills and knowledges are deemed more relevant than others in the reproduction of the current economic system. With respect to the plans and designs produced, a reflection not only on their costs, but also on their impact on future economic opportunities for various players, can increase the level of awareness on the social function of planning and design.

The function of *art* is to embed that what is incommunicable in societies' network of communication. It has the capacity 'to stimulate thinking in ways that exceed verbal or conceptual comprehension' (Luhmann, 2000, p. 141). Especially in design-oriented disciplines, like landscape architecture, a reflection on the artistic ambitions of the discipline can be relevant to the positioning of the discipline and its skills in society. If art can communicate alternative visions of the world, and if it engages in a continuous innovation of the codes of communication and the frames of perception, then an artistic conception of landscape architecture can arguably broaden the worldview of citizens, by shaping their environment in an artistic way (Vanbergen, 1986). But this might come at the cost of alienating many other aspects, actors and perspectives, thus linking back to the reflection on the political embeddings of the discipline (Van Assche et al., 2013; Gunder, 2011). A productive reflection on the artistic embeddings of landscape architecture cannot restrict itself to the question art versus science, or art versus bureaucratic planning, but has to consider the (economic, political, legal, scientific) conditions under which an artistic coding of a design might become more appropriate or desirable. Moreover, it has to be considered what the role of more artistically inspired designs can be in the planning process, without reducing again the discussion to an unproductive opposition between planning and design.

Science is concerned with assessments of the world in terms of truth-values, in terms of the distinction true/ false and scientific knowledge is supposed to be the result of scientific method. Planning and design practice can never be scientific, because of the complex positionality of its knowledge and skills. Instead planning and design practice should be seen as political, striving for collective binding decisions (Latour, 2005; Luhmann, 2000; Luhmann, 1990; Fuchs, 2001). A sustained reflection on the relations between science and planning and design can be useful in outlining which role science can play in practice (Beunen and Opdam, 2011). We argue that the reflection on

the political, legal and economic embeddings of planning and design can greatly assist in delineating the role of scientific analysis. However, the potential role of science in planning and design cannot be merely defined as the space that is left by political, economic and legal powers; scientific contributions can alter the balance of power, the distribution of wealth, the application of law, and the position of artistic approaches. Figuring out what the appropriate contribution of science in a particular case, can be made easier by the reflection on the various other embeddings mentioned above, and by a critical assessment of the utility and limitations of specific scientific tools and approaches. Essential to this, is the basic understanding that science does not give direct access to reality, but constructs reality according to its own premises, and marked by its own embeddings in society. In other words, an understanding of the positionality of scientific knowledge is a *sine qua non* for a systematic reflection on the role of planning and design. Without a firm grasp of the socially constructed character of scientific knowledge, the particularities of the social construction of the other systems cannot be assessed adequately. The latter is necessary to understand the positionality of planning and design, coordinating spatial organization at the crossroads of many forms of knowledge and interests.

Reflexivity in the planning and design curriculum

Based on the previously elaborated notions of reflexivity, we distinguish three normative premises for the structural embedding of reflexivity in planning and design curricula: Firstly, we believe that students need to learn how to deal with complex planning and design practices. The tasks of planners and designers have become more ambiguous and complex and this requires professionals with a wide range of skills, including the skills to interpret the context they work in. If planning and design theory is to be of real use to practitioners, it needs to address practice as it is actually encountered in the worlds of professionals (Hillier, 2002). Therefore planning and design education needs to scrutinize actual planning praxis more often. This partly implies that we need to train student's reflective skills by means of assignments on real life situations and on the social and political context in which they are expected to work (Schön, 1983; cf. Tigerman, 1992; Varnelis, 2007). Not only should they be trained the application of pre-existing tools and methods, but they should be capable to devise their own methods, based upon a variety of useful methods offered.

Secondly we believe that planning and design education should open up for theories, concepts and approaches that fit the ambitions to become more reflexive. Examples are the insights in the constitution of knowledge (Biagioli and Galison, 1999), the relationships between experts and citizens (Fischer, 2000; Latour, 2004) and critical reflections on planning practices (Scott, 1998; Hillier,

2002; Van Assche et al., 2010). These theories all relate to a more critical stance towards knowledge in general and scientific knowledge in particular, especially in spatial governance.

Thirdly we believe students should learn to reflect on their individual actions and thoughts. They should learn to apply these skills to reflect on their role and position within a planning and design processes and how this effects the ways they see the field, its issues and possible solutions.

Discussion & conclusion

Planning and design disciplines and related curricula have traditionally been driven by either positivist approaches implying rational methods bringing society closer to an optimal spatial organization (Fischer, 2000; Pressman and Wildavsky, 1979; Beunen, 2010; Scott, 1998; Jacobs, 1961) or artistic approaches to spatial organization, often built on the romantic assumption of the architect as a visionary. New insights on the constructed nature of knowledge and the increasing acknowledgement of pluralism of perspectives (problem perceptions, ideologies, goals) in society urge the disciplines and the curricula to reform. Complexity, ambiguity and non-linearity are emerging key-concepts and therewith comes a recognition of the limitations of planning and design to solve societal issues and a more modest position for the experts (Woerkum et al., 2011; Van Assche and Verschraegen, 2008; Fischer, 2009). Education is the key to a new generation of landscape architects, urbanists, environmentalist, spatial planners and developers; a generation that is well prepared to face contemporary societal issues often characterized by ambiguity, uncertainty and complexity (Domingo and Beunen, 2013) . Drawing on the post- structuralists and systems theory, we introduced the concept of reflexivity as both a skill and attitude to reflect on personal action and thought and on the position of planning and design within society, as well as on current and potential roles of planners and architects in a given configuration of the function systems.

A focus on reflexivity competes with the training and education of other competences, both in terms of resources as well as in term of focus. Our experiences as teachers learn that for some people (practitioners, scientists and students alike) it is difficult to accept the theoretical insights that focus on ambiguity, uncertainty and complexity and the fact that there are no clear cut methods, tools or approaches that can simply be applied to all situations. For others it is difficult to accept that each approach comes with limitations and that practitioners should therefore develop a state of constant vigilance, a continuous self- reflection that excludes the possibility of routine action. We noticed that such a perspective regularly conflicts with more positivist approaches, often implicitly embedded in many curricula.

A number of further observations are possible. First of all that reflexivity cannot stand by itself, it has to go hand in hand with the acquisition of practical and theoretical skills that are of use to fu-

ture professionals. Reflection and self- reflection cannot be separated in this endeavour. Just as self-awareness emerges on the back of awareness of the outside world, reflection and self- reflection are part of the same cognitive scheme, allowing for both of them. One can say that, in educational terms, a gradual approach, moving from the first to the third level of Luhmannian self- reference, deserves recommendation. The confrontation with all three levels of self- references does prove confusing, especially when combined with the acquisition of various practical skills. Hence, fostering reflexivity is a matter of curriculum design, more than course design. It is possible to recommend a simultaneous introduction of practical and theoretical skills, or more precisely, a simultaneous introduction of action and reflection, with regards to reflection, a simultaneous cultivation of reflection and self-reflection. The gradual approach then lies in the added layers of complexity when moving through the curriculum, from course to course. This added complexity has the character of a slowly increased attention to Luhmann's third form of self- reference, that is, reflection on one's role and potential role in society.

A second aspect of added complexity is the gradual exploration of the various functional embeddings of planning and design in society. In design-oriented disciplines like landscape architecture, planning or urban design, the boundaries and strengths of both artistic and scientific approaches to the role of architecture (and hence its methods) can be introduced early on, but we argue that given the existing versions of professional identity, reflection on legal and political boundaries and on ways of pushing them, should be included at a later stage. In addition, we argue that the combined reflection on several sorts of functional embeddings, and therefore boundaries, should be the object of more advanced courses. The inclusion of both students and teachers from other disciplines proved a workable method here, one that spurs reflexivity by means of a constant confrontation with a variety of perspectives.

With regards to the reflection on the different functional embeddings, it might prove difficult to overcome all hurdles, to reflect on all of them. This can be attributed to the practical and political limitations of any curriculum reform and to the boundaries imposed by current definitions and expectations as to the role of planners and designers. Strong role expectations delimit the possibilities for the reflection on and transformation of roles. Moreover, some forms of reflection require more technical and intellectual expertise than others, and are harder to practice.

The cultivating of reflexivity in planning and design education, with all the value added for professionals and for society, is not a simple and safe endeavour. One has to avoid old pitfalls of the professions of spatial organization. The practitioner envisioned, the reflexive practitioner that is aware of the various embeddings of his discipline and role, and of strategies to partly renegotiate those embeddings, cannot be seen as the all- knowing planner- prince or regal architect. Reflexivity

entails a sharp awareness of boundaries, not a blunt erasing. In terms of educational strategy and curriculum design, one can say then that a triple strategy asserts itself as desirable.

First of all, planners and landscape architects have to remain generalists, versed in various disciplines, well enough to allow for communication with various specialists and to enable reflection on the role and potential role of the profession in society and in particular cases. Secondly, they should be generalists with a specialization, allowing individuals to deepen their understanding of subfields or a neighbouring discipline, but also of a specific functional embedding of the discipline –let's say with law. That way, the profession as a whole, as a community, entertains knowledge of its variety of embeddings in society, and this can only improve the level of discussion within the community (Wilson, 1997). Thirdly, teamwork in real- life assignments, with accompanying theoretical reflection and self- reflection, has to be part of the curriculum. This form of learning does encourage reflexivity in many ways, most of all by exposing students to a variety of disciplinary perspectives, and to a number of stakeholders with a variety of interests and with wildly varying interpretations of places, problems and desirable solutions. In such a situation avoiding reflection becomes difficult, and reflexivity emerges more naturally as a desirable attitude for planners and designers.

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