The Architecture of Knowledge for Educations in Urban Planning and Design

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Abstract
The professional fields of urban planning and design are today facing challenges earlier unimagined. This call for a deeper understanding of the knowledge base of these professions, both when it comes to their central knowledge objects and their inherent knowledge process. Taking the development of a new master's course in urban planning and design at KTH in Stockholm as a point of departure, this article tries to do this by, on the one hand, extending on Bill Hillier's concept “the common language of space” as an intermediate between different professions in the field, and, on the other, design as a common work process for these professions. As also outlined by Hillier, this process is characterised by bringing together different forms of knowledge, such as generative and analytic knowledge, to which is added discursive knowledge. Taken together, it is proposed that they, both for practice and research, form the architecture of knowledge for the field.

Keywords: knowledge, theory, spatial planning, urban design

1. Background and aims for Urban Planning and Design (UPD)
1.1 The original commission of UPD
In 2005 it was decided to launch a new international two-year master's course at the School of Architecture and the Built Environment (ABE) at KTH in Stockholm, called Urban Planning and Design (UPD). The course was directed at a professional field located between spatial planning and urban design and had the ambition to combine large parts of these established areas of knowledge as well as identifying a new professional field. The aim of the initiative was two folded, first, to create an attractive course in an area of knowledge where ABE is the leading university school in Sweden and internationally also holds a prominent position, as to why such a course had the potential to both fill a need and be a success. Second, and more original, to develop and deepen the collaboration between the Department of Architecture (A) and the Department of Urban Planning and Environment (UPE), recognising their very different knowledge traditions and pedagogical approaches. The idea was to see if this could work as a spearhead for further collaboration between departments at ABE, especially when it comes to more dynamic and invigorating educational programs, but in extension also when it comes to research. The commission for the development of the new course can then be summarised:  
- to create a new and internationally competitive master's course 
- to develop a synthesis of the two knowledge traditions of A and UPE
to develop a synthesis of the two pedagogical models at A and UPE
- to identify a new professional field between urban planning and urban design

These are all quite demanding tasks, where the first one is maybe what educators normally work with and is challenging in itself. The development of the course was then not expected to be accomplished overnight but to be a long-term effort of principal interest for ABE. It all asked for some fundamental discussion on the nature of urban planning and urban design both as academic fields and professional practices.

1.2. The knowledge profile of UPD

There were many options for the profile of the new UPD-course for which courses of similar or related nature could work as models. In an international perspective it is possible to speak of at least three possible approaches. First, a course of this kind can be based on a “star faculty”, that is, creating attraction and high quality through the people working in the course, especially if there are prominent and well-known people on the staff. We can call this an authority-driven approach. Second, the course can be given a thematic profile concerning some fundamental aspect of urban planning and design where one feels the university has an unusual strength, for example, sustainable development or advanced design. This, one could call a theme-driven approach. Third, the course can be given an ideological bias, in the sense that it promotes a certain design ideal such as New Urbanism or Modernism, that is, an ideology-driven approach. For the new course at ABE, none of these alternatives was considered attractive or feasible. There was no “star faculty” and thematic or ideological biases were considered limiting to the true potential of the course.

The profile chosen was instead a knowledge-driven approach, which at first might seem too self evident to be either an attractive or explanatory label under which to market a new master’s course. But the field of urban planning and design is far from a self evident field of knowledge, the very reason its educational programs tend to end up authority-driven (the knowledge lies in the minds of certain enlightened individuals), theme-driven (the knowledge becomes biased towards a limited expertise), or ideology-driven (the knowledge takes the form of ideology rather than true knowledge). In this context the idea of a knowledge-driven course seemed both attractive and challenging and implied that the more original part of the commission for the new course would be taken at great sincerity. It implied to develop a synthesis between the two knowledge traditions of A and UP and thereby a knowledge foundation for a new professional field. The approach also seemed to have true potential of long term relevance and international competitive edge.

What possibly can be meant by a knowledge-driven course will be discussed below, but in short concerns that the course, both in its organisational structure and in the content of the individual units, would emphasise the epistemological and theoretical character of the knowledge taught in the course without losing sight of the training of the practical skills necessary for its professional implementation. Put differently, contrary to normal procedure in courses of this kind, the theoretical foundations for the professional practice in the field would be stressed to the students. That is, not only
stressing that there is a lot of theoretical knowledge on different aspects in the field, primarily developed in research, but that professional practice in the field has inherent theoretical foundations. That is, turning the professions of planners and architects from experience based crafts to theory based professions. Certainly, the aim here was not to let this in any way impede on the regular design training typical for these professions and especially for architects, rather to let this theoretical dimension of design support and strengthen the design work.

1.3. The central knowledge object in UPD

Such an ambition presupposes a thorough epistemological analysis of the field of knowledge of the course. It is then obvious that the field is vast. Today more or less all human activity takes place in cities and thereby formulate an infinite list of specific demands on their planning and design. This easily leads to an unmanageable body of knowledge necessary for the course to deal with. It is therefore important to identify the core objects of knowledge for this particular course, since in actual practice one will rely on the contribution and collaboration of other professionals from related disciplines. Drawing from the practice of the two disciplines that today dominate the field, spatial planning and urban design, it is quite easy to identify urban space as the central object of knowledge in the course. Even though the planning and design of cities touches on an extremely vast field of knowledge, what in the end is the central concern here is to provide theories and tools for the emerging urban design profession to structure and shape urban space in relation to these other fields.

Such a conclusion is important since it limits the ambition of the course, which otherwise both runs the risk of suffocating under its own weight and yet create a weak professional identity. What primarily is of interest in the course is knowledge that can support the structuring and shaping of urban space in relation and support of different needs formulated in society. At the same time, this creates new challenges in that our grasp of how knowledge from related fields, such as economic and social studies on cities, are translated into particular designs for urban space is not very developed, which points out the need for the course to be tightly related to research in the field. This translation, furthermore, concerns a translation not only from one field of knowledge to another but a translation from one medium to another in that what has to be managed is the translation from texts and numbers into form, which formulates quite deep philosophical question for the full comprehension of the field. This will not be dealt with here but is a task for the full theoretical development of Urban Planning and Design as a field of knowledge.

1.4. The central knowledge process in UPD

What is important here is to make it clear how this field of knowledge as a practice, is inherently about design knowledge, and that spatial planning, like urban design can fruitfully be understood from the point of view of design theory. Design is a process that is exactly about synthesizing knowledge from many different fields into a complete artefact. Characteristic of this process is the coming together of different forms of knowledge, such as theory, skill and judgment, while it is certainly also about bringing together knowledge from different fields of knowledge. We therefore need two episte-
mological analyses of the field. First, an analysis of the properties and character of its central object of knowledge, that is, urban space, and second, an analysis of the process of knowledge in which this object is structured and shaped, that is, urban planning and design. In the sections that follow, urban space will first be discussed as an object of knowledge and in the following section urban planning and design will be considered as a knowledge process.

2. Epistemological analysis of the field of knowledge of UPD

2.1. The different character of urban space in spatial planning and urban design

Even if the two disciplines have a central object of knowledge in common, their particular fields of knowledge are not unproblematic to synthesise. This is so since the two disciplines have their roots in quite different knowledge traditions. A short comparison of the two can help clarify this.

The understanding of urban space in spatial planning has its roots in a geographical tradition, while the understanding of urban space in urban design has its roots in architecture as another, albeit scientifically less developed, spatial discipline. This gives the two disciplines quite different fundamental assumptions about the character of urban space. First of all, geography is a descriptive tradition and therefore does not in itself carry any immediate keys to planning, which normally implies change of some kind. Rather we see here the prime discipline in “mapping”, that is the development of knowledge of how things are, not how they could be. Architecture on the other hand is in its essence an intervening discipline where the central instrument is not the map but the design, be it for a building or an urban area, that is, an instrument for how things could be rather than how they are. The actual practice of planning was also for a long time primarily conducted by architects and, since the rise of special educational programs for planners, these programs have been influenced by the training of architects.

This could lead to the conclusion that urban space in planning has a more static character and in architecture a more dynamic character, since the first draws so heavily from a descriptive tradition. This does not seem to be true. More important, and pertaining to this, is what it is that is mapped and designed in the two disciplines respectively. Simplifying a little, what is mapped in geography is different “contents” in space, such as people, institutions or economic activities. All these contents can then give rise to thematic maps of their spatial distributions. In architecture what is designed is not so much the distribution of such contents as the distribution of “space itself”. The intent of the architect is to structure and shape space, clearly with an idea of its use, but the uses are not part of the architect’s material in the way they are for the planner, rather the material for the architect is “space itself”. An important distinction therefore is between geography which primarily deal with distributions in space and architecture that primarily deals with the distribution of space (Koch, 2004).

This is of fundamental importance when it comes to the different understandings of urban space in spatial planning and urban design respectively. In architecture urban space quite specifically has to do with the shape and structure of space itself, not irrespective of its content but always with
space as an intermediate to this content, while urban space in spatial planning is more directed to the distribution of different contents in space. To be more specific, in geography, there is no such thing as “space itself”, since there simply is no such thing on the surface of the earth. In the geographic context, “space itself” rather falls within the domains of geometry and is referred to with concepts like the pre-geographic or geometric dimension of geography (e.g. Miller, 2000). Geographic space is instead defined by what we here have called the distribution of contents in space. It is this understanding of urban space that is transmitted into the discipline of spatial planning. As a result what is planned in spatial planning are such content: that is, different contents are given a certain location and spatial extension in a plan. We can see this in the fact that what planners predominantly has worked with is the development of different plans and regulations of land-use.

In urban design, on the other hand, what is designed is never what we have called contents but spatial containers for such contents, and, furthermore, containers for spatial relations of such containers. That does not mean that these contents, for example in the shape of different land-uses, are irrelevant, far from it, but they are not addressed directly in urban design but through the intermediary of what we have called “space itself”. A conclusion of this is that if the knowledge tradition that underpins urban and spatial planning is geography, the knowledge tradition that underpins architecture and urban design rather is geometry. If we then look upon the urban planning and design process as a relation between form and function for a while, we can say that spatial planning emphasise functions, that is, all the different contents that have or need to acquire a location and spatial extension, while architecture emphasise form, that is, the adequate and attractive shape and structure of space developed to accommodate different contents. This distinction between spatial planning as an essentially “functionalist” approach to urban space and urban design as rooted in a “formalist” approach to urban space should not be over-emphasised but can serve as an important conceptual premise for a successful reconciliation of the two knowledge traditions.

In the knowledge tradition of Spatial Planning
- Geographical tradition
- Comprehensive level
- System world
- Distributions in space

Figure 1. The understanding of urban space in the knowledge tradition of spatial planning.
If this is one fundamental difference in the understanding of urban space in the two disciplines, a second one is the simple fact that they traditionally work on very different scales of cities. Spatial planning works at a comprehensive level dealing with the general distribution of land-uses within a municipality for example, while urban design work on a detailed level, dealing with the design of a specific housing unit for example. This is reflected in the institutionalised planning process in Sweden where the two primary documents are the comprehensive plan and the detailed plan, where one roughly can say that the first is mainly a product of spatial planners and the second the product of architects.

As a result of this we have two professional disciplines that are able to deliver quite competent work in their different areas. We therefore find both well developed comprehensive plans that give different land-uses relevant locations, delimit and protect valuable green areas and creates space for new investments in infrastructure etc, as well as well-studied and attractive detailed plans of, for example, housing with well-shaped public spaces and good accessibility to retail and public transport etc. But we also find in a very concrete and visible way gaps between these two levels of urban development. When one leaves the well-planned housing area one enters a landscape of highways and green-belts which is of a totally different scale. The two levels of planning simply do not seem to connect with each other in two quite specific but critical ways. On the one hand, there is a gap between the comprehensive scale and the detailed scale where, when moving between them, one seems to enter different worlds. On the other hand, there is a gap between different areas at the detailed scale, since these do not create continuity within the city but rather form a patchwork defined by the limits of the different detailed plans. These gaps can in real life be overcome most of the time, but on a theoretical level they are deeply problematic since they are not the result of a conscious planning process but rather the fact that different parts of the planning process is taken care of by different disciplines coming from different knowledge traditions with, as we have seen, even different fundamental understandings of urban space.

Figure 2. The understanding of urban space in the knowledge tradition of urban design.
It is a truism that how we act upon the world is based on what we know about the world. What is less recognised is that what we know about the world is based on how we describe the world. If we primarily understand urban space as the spatial extension of land-uses, we can develop knowledge about how to deal with these, which then can support professionals in spatial planning. Similarly, if we understand urban space as the shape and structure of urban space itself, we can develop knowledge about how to design such space, which can support professionals in urban design. As a consequence the very appearance of cities, that is, how we have planned and designed them, is based on our current knowledge and understanding of them. But this means that we also can detect gaps in such knowledge on the very surface of cities. Such knowledge gaps are exactly what we meet when we, as in the case above, leave the carefully designed housing area and entered the landscape of highways and green-belts.

To capture more exactly what this knowledge gap is all about, in respect of the different scales the two disciplines primarily are active at, we need to be more precise about what characterises the knowledge on the comprehensive level of urban planning and the detailed level of urban design. The comprehensive scale which dominate the practice of spatial planning lead to a rather abstract understanding of urban space, that is, as something external and rather distant to an experiencing subject. This abstract understanding of space is strengthened by the earlier observation that what is primarily dealt with in spatial planning is urban space as defined by the distribution of certain land-uses in space. Such distributions are most of the time quite difficult to experience in real life, particularly since in real life many different land-uses overlap in ways that are not possible to perceive. Taken together, this leads to a particular understanding of urban space that we can call a system-perspective, drawing on a concept from Jürgen Habermas (1984).

In urban design, on the other hand, which primarily is active on the detailed level, the understanding of urban space becomes more concrete, as something individuals actually can experience and perceive. This is similarly strengthened by the understanding of urban space in urban design as space itself, which most of the time is designed exactly from the perspective of an experiencing subject. This, on the other hand, leads to an understanding of urban space that we, once again drawing from Habermas (1984), can call a life world-perspective. What we experience in the example above, when moving from a well designed housing area and enter a confusing landscape of highways and green-belts, is exactly the movement from urban space designed from a life world-perspective to urban space planned from a system-perspective. So if we earlier were able to identify one fundamental difference in the understanding of the central object of knowledge in the field between the two disciplines, what we called the functionalist approach in spatial planning and the formalist approach in urban design, we can here identify a second one. In spatial planning there seems to be a predominant system-perspective on cities while there in urban design seems to be a life world-perspective.
It is important to stress that this does not imply that the one is better than the other, for example that a life world-perspective is better or more relevant than a system-perspective. The conclusion is rather that they have each proved successful in their individual arenas and that cities are fruitful to understand both as systems and life worlds. The problem is rather that we have two quite isolated disciplines with very different understandings of what cities are, which do not collaborate much, leading to an unsatisfactory planning and design of our cities. What we need is a deeper collaboration between the two disciplines both in the development of new knowledge, that is, research, but also in the application of knowledge in professional practice. It is then clear how a possible further step of this is a merge between the two disciplines into one or the development of a new intermediating discipline between the two. It is exactly these possibilities that the UPD-course explores.

2.2. The character of urban space in UPD

The investigation so far can be seen as a contribution to one of the main tasks in the development of this course, that is, to create a new professional field between urban planning and urban design, where we here have identified quite precisely where such a field is located and what kind of fundamental knowledge questions it needs to answer. But it is also a contribution to the task of developing a synthesis of the two knowledge traditions of A and UPE, where we here quite specifically have been able to describe some fundamental aspects of these two traditions. In summary, if we believe that how we act upon the world relies on what we know about the world and that this in turn relies on our fundamental descriptions and understandings of the world, we can at this moment reveal an unreconciled conflict in the development of our cities between, and now clearly exaggerating to make a point, a functionalist system world approach in spatial planning and a formalist life world approach in urban design.

The problem here is not that one discipline tends to emphasise function and the other form. What is implied in the epithet formalist or functionalist is that ones action has become ideologically-based rather than knowledge-based; that is, that we may believe that it is only function that matters or only form, or that we are so stuck in a way of thinking where for example function is so central that we neglect the development of knowledge in its relation to form. The same discussion can, of course, be made concerning the system or life world perspectives. To say that one's action has become ideologically-based is in this context not saying that one has chosen to adhere to a certain ideology but rather that one is not aware of the fact that one's knowledge has become limited and is in need of further development. This is not something dramatic but a quite natural situation in the continuous development of knowledge.

What is argued above is that we have reached a point where the two disciplines are coming close to, in this sense, being ideologically-based, at least on issues common to both of them. Under these conditions, both researchers and professionals in urban design have great difficulty to even imagine that urban space can be defined as something other than “space itself”, and researchers and
professionals in spatial planning may have great difficulty in imagining that such a thing exists as “space itself”. The truth is that space can be understood in both ways and that an acknowledgment of this can lead to a reconciliation and deeper understanding of the relation between form and function in urban development. Similarly, it seems that urban designers have come close to being ideologically-based in their practice in that they have difficulties in handling the city as a system and rather want to deal with it in small isolated units, while spatial planners have similar difficulties in implementing their knowledge in planning documents that truly affect life worlds.

This more or less defines both the field of knowledge to which the master's course at ABE aspires and what needs to characterise its understanding of its central object of knowledge, urban space. First, it needs to reconcile the geographical and architectural knowledge traditions into a new combined tradition, where it can be said that what is characteristic for this new tradition is the emphasis of the geometric level of geographic description. When we analyse cities in our efforts to develop new knowledge about them and when we plan and design cities in our efforts to apply such knowledge in real cases, we need to acknowledge and critically handle the geometric aspect of urban space and how this relates to different uses of urban space. We have already seen how this involves the reconciliation of distributions in space of what we have called different “contents in space” and distributions of space, that is, what we have called “space itself”. What we aim at is making these connect with each other in order to develop knowledge about their interplay so that we can arrive at a more reliable understanding of the relation between form and function in urban space, thereby making urban planning and design more powerful and precise. We can say that what we are looking for is knowledge that can help us make the planning and design of the distribution of space support the distribution in space, that is, reconciling them into distributions through space (Koch 2004).
Second, the curriculum needs to develop both knowledge and methods on how to reconcile the different scales of cities and here it quite obviously is necessary to develop this concerning the intermediary level in-between what today is understood as the comprehensive scale and the detailed scale. Put differently, we need to reconcile the understanding of the city as system and life world, where neither have preference but where both positions acknowledge that the system to a high degree is generated and especially sustained by the life world and the life world is in turn generated and sustained by the system. Just as there is a risk in becoming a functionalist or a formalist of not acknowledging the interplay between form and function, there is a risk of becoming a localist or a globalist without acknowledging the interplay between the global system and the local actions. Once again the aim must be to try to make these two levels connect and develop knowledge of their interplay. Furthermore, in this case it is likely that if we do not develop this knowledge we will probably not be able to develop knowledge on the form function-relation either. What we are looking for here is to plan a system that can support the design of the life world, as well as the other way around, that is, system sustained life worlds and life world sustained systems.

If this can be successfully realised we have truly developed a new field of both knowledge and professional practice that, to at least some extent, merges the two current dominant disciplines in the field of spatial planning and urban design. It is here proposed that this field of knowledge is called Strategic Urban Design (SUD).

3. Epistemological analysis of the knowledge process in UPD

3.1. KTH as a university of design

If the central knowledge object in the field of knowledge we here call Strategic Urban Design is urban space, we have already hinted at that the knowledge process behind the professional shaping and structuring of urban space is design. Design is normally more often connected to the field of architecture rather than spatial planning, but that is not what is intended here. Rather it is important to remember that the design process is far from unique to the academic field of Architecture and that the activity of planning can quite easily be embraced by the concept. As a matter of fact, it is an important foundation for many fields of knowledge at KTH. The introduction of the concept of design should neither be regarded as specific to Architecture or as something dramatically new to KTH. As a university of technology what is a stake at KTH is never only the generation of new knowledge through research or the dissemination of knowledge in educational programs, but also the innovative application of knowledge in new products and processes. Such application of knowledge is exactly what design is about. Thus, a university like KTH could be looked upon, not so much a university of technology as a university of design.

3.2. A descriptive model for the field of knowledge in strategic urban design

Strategic urban design work is about giving shape and structure to urban artefacts, which implies a process known as the design process. There is a rich literature in design theory and the following discussion will follow quite closely, and try to add to, a strand of design theory developed in the
earlier writings of Bill Hillier (1974, 1976, 1984, 1993). This strand emphasise how such processes comprise different phases characterised by different forms of knowledge. Most commonly recognised is the creative phase, where the designer sketches possible solutions to an urban space problem. But just as important is the predictive phase, where the designer tries to envisage the effects of the solutions by considering whether they will work. Such predictions can also be interrogated within a broader context, such as: how will the proposal be received by contemporary society. In the latter case the predictive phase is not so much about prediction as discernment and can therefore be called the assessment phase. In real life these phases are interlaced in a continuous process. The important thing is to realise, first, that all of these phases are in need of theoretical support but, second, that this theory is of epistemologically different kinds and therefore generated in quite different ways.

The bottom-line of the often mystified creative phase is to know how to apply experience in new situations. This is not to deny the intuitive dimension of creativity. Rather intuition to a large extent seems to be exactly about the ability to let former experience subconsciously lead one's action. As in life in general, more or less any experience can be useful in strategic urban design, but more specifically it obviously has to do with experience in professional urban planning and design. This can concern experiences of urban artefacts as well as ideas of the urban. A creative designer is able to translate these experiences into a set of possible perspectives or approaches, *a repertoire*, from which it is possible to select a productive approach in relation to future specific architectural problems. Speaking from the point of view of theory in general this is a vague landscape of theory. Still, in architecture it has a long history and it can be argued that the majority of architectural theory falls into this category, which Hillier calls *generative* theory (1996).
It is maybe more obvious how the predictive phase needs theoretical support. On what grounds can we predict the performance of urban artefacts when it comes to things like social segregation, retail attraction and energy consumption, for example. To a certain extent it is possible to once again go to experience of earlier cases. But characteristic of contemporary urban development is the complexity and uniqueness of each architectural project, which makes it difficult to transfer experiences from one project to another. Instead one needs to turn to some principle, which, if it is to be successful, furthermore needs to be empirically supported. What is needed is theory of a more familiar sort, that is, scientific theory of a traditional kind, which here, once again following Hillier (1996), will be called analytical theory.

Now, the predictive phase needs to be elaborated a bit, and here we add to Hillier’s discussion, since it is often misunderstood as the direct application of analytical theory, a reason why it has been so heavily criticised, not least as a tool in urban planning and design, since such an understanding obviously runs the risk of falling into technocracy. Analytical theory concerns what is going on in general. In real life different needs will be in conflict with each other, so that general rules need to be translated to specific situations. This presupposes discernment in the architect, which research can support but never replace. Discernment is also necessary when it comes to “predicting” an architectural project's performance in a larger context, such as how it will be received in its cultural or social context, in what was previously called the assessment phase. Such questions cannot be answered in the exact and often quantified way typical for analytical theory but need support of a different kind, that is, theory as it is developed in the humanities and those areas of the social sciences inspired by the humanities. Such theory will here be called discursive theory, adding a third category to Hillier’s earlier discussion.
We then more specifically can see the different types of knowledge at work in the process of strategic urban design. In the creative phase we see the need for something we can call *generative knowledge*, in the predictive phase something we can call *analytical knowledge* and in the assessment phase something we can call *discursive knowledge*. It is of course important to remember that these forms of knowledge interact in different ways and sometimes one kind of knowledge can be put to use in the form of another. For example, discursive theory is often supported by analytical theory, just as analytical theory can be put into context by discursive theory, while both analytical and discursive theory can work as generative theory.

### 3.3. The epistemological origins of the forms of knowledge in the design process

Now, there are two results of this description of the process of strategic urban design. First, it makes clear the central elements of knowledge at work in the design process and therefore that if one is aiming at new knowledge of the design process, all of these elements need to be acknowledged. Second, it is quite clear how the different kinds of theory referred to originates in different knowledge traditions and therefore new knowledge within each of these will be generated in quite different ways drawing on their respective knowledge traditions. The conclusion is that since they all are necessary for the development of new design knowledge each and everyone need to be respected for their different integral needs and traditions.

Analytical theory is clearly what we find in engineering and the natural sciences as well as the parts of the social sciences that are inspired by these knowledge traditions. Discursive theory, on the other hand, has strong ties to the humanities and the parts of the social sciences that are inspired by the humanities. Generative theory, finally, does not fit into these knowledge traditions but rather has its roots in theory as it is understood in art (Hillier 1996), where the idea of theory is concerned with how things could be rather than how they actually are, the domain of traditional scientific em-
deavour. Generative theory being less acknowledged in academia needs some further elaboration, especially since it is a crucial element in the design process and since the field of urban design is extremely rich in such theory and that, furthermore, in two ways.

First, most theoretical production in urban design, from Camillo Sitte (e.g. Sitte, 1945) to New Urbanism, falls into this category. Even though it can be disguised as both analytical and discursive theory, most of the time it is weak as such theory. The aim of its authors is another, namely to expand the field of possibility in architecture, most of the time with a normative aim - the new possibilities the author is presenting are the ones that should be chosen - but it does not need to be read like that. Rather, such theory more often serves as inspiration, helping urban designers to broaden their own experience and repertoire with new possibilities in urban design. Second, architectural projects and designs are in themselves carriers of generative theory. Realised or not, such projects do the same thing as the architectural theories referred to above, namely they present new possibilities in urban design that help architects to expand their own experience and repertoire. The construction of Seaside is more likely to have promoted the ideas of New Urbanism than the writings of Andres Duany (e.g. Duany, et al., 2000). This is the obvious reason the study of real cases has always played such a central role in urban design education.

Apart from the earlier conclusion that most analytical and discursive theory can serve as generative theory, the rather surprising conclusion concerning generative theory is that architectural history can play a critical part, since it is the area of knowledge that records the history of both architectural theory and architectural projects. With some afterthought, this is not so surprising since it is exactly in this way that we can learn from history. History does not produce analytical knowledge from which we can predict what will happen, history is the prime science in collecting human experience, thus, history can help us expand our personal experience, as humans in general but also as professional designers. Apart from this less obvious source, there is a great range of possibilities to develop generative theory, for example in experimental projects or student work.

3.4. The potential of generative theory at ABE and KTH

Some further comments concerning the more unusual form of knowledge discussed here, generative knowledge, are necessary. From the above it is clear how generative theory is an extremely important aspect of design theory in general and how the field of architecture can present a tradition of such theory without comparison in any other design field. Architecture therefore has an extremely important role to play concerning the development of design theory at a university like KTH. As a matter of fact, if we look upon KTH as a university of design, following the earlier argument, we can see how it is exactly in this aspect of design that KTH generally is weak. Concerning analytical theory and thereby the predictive phase in the design process KTH has a solid base to stand on in the many fields of knowledge the university comprises, not least within Urban Planning and Environment. Likewise one has many schools and departments that in recent years have expanded this knowledge and awareness when it comes to discursive theory and thereby what we have called the assessment phase in the
design process, including Architecture and Urban Planning and Environment. But when it comes to generative theory KTH is, generally speaking, weak. The prime exception to the rule is the Department of Architecture, where exactly this aspect and phase of the design process has been consciously studied and even theorised for a long time.

On the other hand, if Architecture has an exceptional record when it comes to generative knowledge, and like the rest of KTH in recent years has expanded its knowledge and awareness concerning discursive theory, it is weak when it comes to analytical theory. This is deeply problematic for the field of knowledge of architecture and especially its practice for two reasons. First, it is problematic because it leaves practicing architects without powerful tools to predict the effects of their work. The perpetual criticism of architectural work during the 20th century, when the credibility for Swedish architects finally sunk to an all time low, can be seen as an effect of this. Second, even though there has been both an interest and growing awareness of the importance of discursive theory in recent years, thereby setting architectural work in a larger social and cultural context, and leaving aside its technocratic tendencies, such theory can be difficult to tie to individual architectural projects without the support of analytical theory.

The master's course discussed here seems most fruitful in joining the specific strengths in the two departments of Architecture and Urban Planning and Environment into something that can be called Performance Based Design. But this can also be seen as spearheading a more conscious design approach in professional training and professional knowledge application that can prove interesting also for other educational programs at KTH, both when it comes to attracting new students and in achieving professional success for examined students.

4. Conclusion
In summary, the master's course in Urban Planning and Design aims at the development of a new field of knowledge that synthesises the disciplines spatial planning and urban design, where it identifies urban space as its central knowledge object, which is professionally structured and shaped through strategic urban design, where all the knowledge forms of generative, analytical and discursive theory come together to create performance based design. To fully exploit this potential, common to other similar educational programs, this article has aimed at discussing its fundamental architecture of knowledge.

References


