Doctoral Education in Architecture

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Challenges and Opportunities

Edited by

Gülsün Sağlamer and Fatma Erkök

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PREFACE

GÜLSÜN SAĞLAMER

Knowledge creation is an essential function of higher education institutions. However, the exact boundaries of that function and the methodologies for serving that function evolve over time. The strategies for knowledge creation are twofold. At one level, the administration, together with the stakeholders of the institution, must determine its strategy within its current context. At the second level, it has to create a dynamic structure that can question and re-orientate that strategy as the context changes. Executing strategy effectively is a growing challenge in a rapidly evolving context. Observing, assessing and integrating best practices from around the world to formulate how best to meet this challenge is a shared objective of all leading higher education institutions.

There is a strong need for leading universities to join the ranks of higher education institutes at the forefront of knowledge creation. However, universities should be able to recognize the fact that more important than being at the forefront at one point in time is the ability to remain in that position by learning and adapting to changing circumstances. With this understanding, universities have to take on the ambitious task of fundamentally re-orientating and redesigning themselves to be constantly learning institutions and be determined to maintain a permanent seat at the forefront of knowledge creation for decades to come (Sağlamer, G., Karakullukçu, M., 2004).

This is the context in which graduate education sits, so it is important and timely to reflect upon graduate education, and especially PhD programmes, in both concept and practice and consider their history, scope and possible trajectories. It is well known that doctoral education does not have a very long history in the western world, starting only less than 200 years ago and mainly focusing on the social sciences and basic sciences. Doctoral education in the basic and social sciences and even in engineering and technology has evolved through the centuries and is still evolving to meet the changing requirements of society and industry. As the borders are melting between research on basic sciences and industrial research and between research and innovation, together with decreasing

state finance, the need for different approaches to doctoral education has become an important issue on the agenda of universities.

On the other hand there is a strong concern coming from higher education institutions that if the basic and social sciences are neglected, there will not be sustainable development in knowledge creation and therefore bottom up curiosity-based research should be given importance and extensive funding should be available to maintain the quality of research in academia. This discussion is also shaping the research and innovation policies of national and supranational funding agencies all around the world. One more issue that should be stressed here is that "scientific progress on 'major societal' challenges of energy supply, climate change, food security, health and ageing require medium and long term commitment of funding instruments that support both basic research and collaboration with industry and other external partners" (EUA, Smart People for Smart Growth, 2014 p2). Doctoral programmes and research activities that are structured according to these new developments are also paving the way for new forms of collaboration and funding and policy instruments such as joint degrees, transferable skills, mobility of researchers, co-funding, autonomy of universities etc.

Where is architecture in all of these developments? Doctoral training started very late in the field of architecture and many architectural schools started to implement the PhD as a requirement for their academic staff just a few decades ago. For this reason doctoral training in architecture developed very slowly and sometimes even took steps backwards in some institutions. Initially doctoral degrees were awarded in architectural history and theory, and this trend lasted until the mid-20th century. Architectural schools, faculties and departments that are part of technical universities have been pioneers in offering PhD in architecture other than the fields of history and theory of architecture and have also started to require a PhD or doctoral degree in architecture for their academic staff. Taking a retrospective view, it is clear that conceptual frameworks of "research for design", "research in design" were first nurtured by these architectural schools and they were followed by others. "Research through design" has always been discussed by many professionals and academics in architecture and they have stressed the importance and the necessity of this category of research in architecture. Compared to the basic sciences, social sciences, engineering, technology and health sciences, doctoral training in architecture is not well defined. This fact causes many contradictions in the development and improvement of doctoral programmes in the field of architecture.

This workshop was designed with the aim of clarifying some of the

vague issues that have been discussed for a long time at architectural circles and create a platform to share experiences and to make comparisons between different PhD or Doctoral degree programmes to make further improvements in our institutions.

The book, which contains chapters by authors from a number of countries, is divided into three parts. The first part starts with a chapter that aims to define a framework for doctoral education in architecture and focuses on the creation of a discussion platform for doctoral education in architecture. Some of the questions that were discussed widely in this chapter may be listed as follows: how to define research activities in architecture, what are the challenges that we face, how to measure success in doctoral education in architecture, what could be the impact of the university-industry partnership in research and innovation on doctoral education in architecture and how to fund doctoral education. Through these discussions, we have tried to articulate some common wisdom on these questions.

Chapters 2 and 3 of Part I are the contributions made by two distinguished keynote speakers, Prof. Gary Moore and Prof. Kemal Gürüz, defining doctoral education both in the field of architecture and in general. Kemal Gürüz, who was the president of the Council of Higher Education of Turkey (1995-2003), summarizes graduate level studies and gives a historical perspective together with current practices in the second chapter of Part I. Gary Moore, who has done extensive research on doctoral education in architecture discusses the structure and content of doctoral education programmes in architecture around the world in the third chapter of Part I.

In the second part of the book, some of the universities that took part in the first survey (2011) on doctoral education in architecture, shared their very valuable experiences in their schools in different chapters. In Part II, the first chapter summarized the 2011 survey that was initiated and implemented by the ITU team namely Gülsün Sağlamer and Fatma Erkök. In the following chapters of the second part representatives of 8 universities outline their doctoral education in architecture. These universities can be listed as follow: Delft University of Technology, Faculty of Architecture, Bartlett School of Architecture, UCL, ETH Zürich, Department of Architecture, Université Catholique de Louvain, Faculty of Architecture, Architectural Engineering, Urban Planning; Budapest University of Technology and Economics, Csonka Pál Doctoral School, Aristotle University of Thessaloniki, School of Architecture, “Ion Mincu” University of Architecture and Urbanism, ITU Faculty of Architecture, Faculty of Architecture.

The third part of the book contains the aims and achievements of the workshop together with some proposals for future studies in this field. As the problem itself is not well defined, we should not expect to reach concrete proposals at the end of this book, but rather to understand the internal and external constraints of doctoral education and their continuously changing impact on the whole education process.

The book contains extensive information and experiences of some leading universities on doctoral education in architecture written by academics who sincerely believe that there is a great need for research in architecture and on its doctoral education. A common belief among the participants is that there is also a great need to create awareness in the academic world and in industry about the different aspects of architectural research that might not be comparable with the basic sciences or engineering and technology, but still may serve to generate important knowledge for shaping a better built environment for a sustainable future. The participants of the workshop and contributors to this book feel strongly that such awareness must be created for the research funding agencies at national and international levels to understand the importance of research in architecture that will strengthen the capacity of the architects for shaping the built environment with sound knowledge and creative solutions.

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We would like to record our thanks to all contributors and also the workshop participants who have made substantial contributions to the existence of this book. We would also like to acknowledge the invaluable help provided by Istanbul Technical University Rectorate and Faculty of Architecture together with our sponsors who made the research that we have done in 2011 and the workshop possible. Our last but not least thanks go to Sally Bradbrook for her continuous support and careful editing.

INTRODUCTION

GÜLSÜN SAĞLAMER AND FATMA ERKÖK

There is at present growing interest in the academic world in the topic of doctoral education. The world is changing and the growing need for innovation and technology development is forcing the revision of how researchers are trained in this new setting. Doctoral study is an essential part of the start of academic research. It establishes the main setting for gaining the essential skills for scientific research. Doctoral education has for a long time been a cornerstone for this training. Carrying out independent scientific research and contributing to scientific knowledge with original work is today's definition of doctoral work, yet this was not exactly how it was in the past, being mainly a relationship of master and apprentice. With this paradigm shift, education and its components had to be changed too. The new perspective of doctoral education places more importance on the PhD student as an independent researcher, rather than unpaid labour.

As a matter of fact, this need for change requires the revision of present education systems, with their positive and negative sides. An overall evaluation and understanding of future challenges is only possible with such an approach. This volume tries to make such an evaluation for the field of architecture.

The volume starts with setting the scene for research in the field of architecture. The workshop, which was carried out as a sequel to a survey and as a discussion platform for these issues provided the opportunity to exchange ideas. The contributions of participants of the workshop are the main material of the volume, and include the state of education in their own institutions and their evaluations for the problems and potentials of doctoral education in architecture. This volume is envisaged as an initiator of discussion in this field, which is still a void. Meetings and discussions can build upon this study.

The editors of the book started the project with research that aimed to investigate the state of doctoral education in architecture at Istanbul Technical University. During this research, in order to adequately evaluate the position of ITU regarding doctoral education in architecture, a

comparative look at other institutions providing similar education was required. Hence, a pilot study was planned and carried out in 2009, as a means of examining, comparing and discussing the nature and structure of doctoral studies in architecture across Europe and the US in order to provide an overview of the situation and the problems that they have in common, to exchange good practices in order to develop better solutions by examining and comparing doctoral studies in architecture. The survey was distributed to 50 institutions in Europe and America, and was responded to by 25 institutions in November 2011. The responding institutions were from a range of countries: Australia, the Netherlands, Switzerland, Germany, Belgium, France, Hungary, Greece, Italy, United Kingdom, Romania and Turkey.

Based on the pilot study, a workshop on 'Doctoral Education in Architecture' was organized by ITU Faculty of Architecture in November 2011 with contributors mainly from the institutions that participated in the pilot study. Nine universities were represented at the workshop. The representatives are listed below:

1. Delft University of Technology (Netherlands), *represented by Hans Beunderman (and Frank van der Hoeven)*
2. ETH Zurich (Switzerland), *represented by Rudolf Krieg*
3. Université Catholique de Louvain – UCL (Belgium), *represented by Olivier Masson (and Jean Stillemans)*
4. Budapest University of Technology and Economics (Hungary), *represented by Katalin Marótzy*
5. Aristotle University of Thessaloniki (Greece), *represented by George Papakostas, Vilma Hastaoglou-Martinidis & Constantin Spiridonidis*
6. Bartlett, UCL (United Kingdom), *represented by Murray Fraser*
7. University of Sydney (Australia), *represented by Gary Moore*
8. Ion Mincu University of Architecture and Urbanism (Romania), *represented by Stefan Simion*
9. Istanbul Technical University (Turkey), *represented by Gülsün Sağlamer and Fatma Erkök*

The objectives of the workshop were to establish a discussion platform based on the information that was collected through the questionnaire and to define the bottlenecks and critical issues in PhD Education in Architecture. Discussions focussed on the comparison of different types of doctoral programmes in terms of organisational issues together with the aims-achievements-problems and advancements. A special focus was the integration of doctoral programmes in the world outside academia and the possibilities for future collaboration among institutions.

The workshop that took place on 28-29 November 2011 consisted of the following parts:

- Welcoming Speeches
- Keynote Speeches
- Presentations of the Workshop Participants, Sessions 1 & 2
- Workshop Session 1, theme: ***"Organisational Issues in Doctoral Programmes"***
- Workshop Session 2, theme: ***"Possibilities for Innovative Doctoral Programmes in Architecture"***
- Closing Session: "Possibilities for Future Collaboration"

Welcome speeches were given by the representatives of the workshop organisers and hosts of the institution, Prof. Dr. Gülsün Sağlamer (co-chair of the workshop), Prof. Dr. Orhan Hacıhasanoğlu (Dean, ITU Faculty of Architecture) and Prof. Dr. Muhammed Şahin (Rector, ITU). Two keynote speakers were invited to the workshop with the following discussion topics:

1. Prof. Kemal Gürüz (Turkey - former President of the Turkish Council of Higher Education, Professor Emeritus of Chemical Engineering, Middle East Technical University)
   title: ***"Graduate-Level Studies: An Historical Perspective And Current Practice"***
2. Prof. Gary Moore (Professor Emeritus of Environment-Behaviour Studies, Faculty of Architecture, Design & Planning, University of Sydney, Australia)
   title: *"****The Structure & Content and Some Observations about Global Doctoral Education in Architecture"***

The presentations given by the workshop participants are the basis of the articles presented here and can be found in Section 3. Workshop Session 1 had the theme of *"Organisational Issues in Doctoral Programmes"* and aimed to create a discussion on the organisation of doctoral programmes in each participating university. Prof. Hans Beunderman from Tudelft chaired the session and the discussion involved all the participants. Workshop Session 2 had the theme of "*Possibilities for Innovative Doctoral Programmes in Architecture*" and aimed to discuss the newly emerging position of doctoral research. Prof. Dr. Gülsün Sağlamer from ITU chaired this session. There were three presentations by

guest speakers. The presenters and their presentation titles for this session were as follows:

1. Pelin Dursun (ITU Arch.) and Gülsün Sağlamer (ITU Arch.): ***"The Need for New Approaches in Housing Research and Doctoral Programmes"***
2. Florinel Radu (College of Eng. and Arch. of Fribourg), ***"Inside Looking Out: A Framework for Discussing the Question of Architectural Design Doctorates"***
3. Alpay Er (ITU Industrial Design Dep.) ***"University-Industry partnership: Postgraduate Education in Industrial Design in Turkey"***

The workshop was also enriched by participants invited from different universities: Zuhal Ulusoy (Kadir Has University), Birgül Çolakoğlu (Yıldız Technical University), and Ayşe Şentürer (ITU), all of whom made valuable contributions.

The volume contains the contributions by participants regarding their own contexts-conditions-problems and excerpts from the discussions. The editors believe this material will provide a meaningful basis for further studies and discussion on the issues involved.

PART I:

DEFINING THE FRAMEWORK FOR DOCTORAL EDUCATION IN ARCHITECTURE

CHAPTER ONE

FORMING A DISCUSSION PLATFORM FOR DOCTORAL EDUCATION IN ARCHITECTURE

FATMA ERKÖK AND GÜLSÜN SAĞLAMER

The workshop comprised presentations by keynote speakers, participants from diverse universities and other invited speakers, thematic discussion sessions and a closing panel. The presentations given by the university representatives have been turned into articles and are in Section 3 of this book. In this section the focus will be the discussions that took place during the workshop itself. There were two thematic discussion sessions in which pre-defined topics (such as *"Organizational Issues in Doctoral Programmes"* and "*Possibilities for Innovative Doctoral Programmes in Architecture*") were used to focus and orientate the discussion. There was also a question and answer session at the end of each presentation. This section consists of selected excerpts from these discussions. These summarize and reflect the essential points of the workshop. The editors have attempted to structure the issues discussed at the workshop. The sources of the excerpts are sound recordings that have been transcribed. Discussions at times followed the pre-defined topics and at other times flowed spontaneously from one topic to another. For the sake of bringing order to the collected material, the discussions are grouped into three main topics. These topics are:

1. Architectural research and doctoral education. This topic mainly explores the relationship between architectural research and doctoral education.

2. Managing doctoral programmes. This topic deals with the management of doctoral programmes in architecture in relation to the tools, products, and features of this area of education.

3. **Restructuring policies on doctoral education.** This topic discusses the issue on a larger scale by examining the emerging policies that are being shaped by current overall changes in the world.

Kemal Gürüz

Gülsün Sağlamer

Gary Moore

Georgios Papakostas

Fatma Erkök

Constantin Spyridonidis

Katalin Marotzy

workshop participants

Vilma Hastaoglou-Martinidis

Murray Fraser

Olivier Masson

Pelin Dursun

Hans Beunderman

Rudolf Krieg

Stefan Simion

workshop participants

workshop participants

poster

1. Architectural research and doctoral education

In this section, the relation between architectural research and doctoral education will be examined concisely with the subheadings: “Architectural research (and its properties)”, “Interaction between research and practice (and their contribution to each other)” and “Unification or diversification in doctoral education in architecture”.

1.1 Architectural research

Before examining the nature of architectural research, we must look at the general definition of research and then examine the nature of architectural research.

Arnold, within the environment of that period, stated in 1979 that; “the mass of today’s research is not directed towards the pursuit of knowledge, but towards its authentication”. Science tells us that a theory or observation is not part of knowledge until proven, and so research is often not the noble investigation of unknown territory, but its measurement after someone has taken the risk to discover it. Thus there are two distinct styles of researching: one relating to discovery (or invention), and the other to authentication. French mathematician Poincare says: “it is by logic that we prove, but by intuition that we discover.” Discovery is search, while re-search is backtracking to prove the truth of the search. The institutionalisation of research emphasises the latter task, rather than the former (Arnold, 1979). Theodore Von Kármán (Hungarian-American physicist and aeronautical engineer) wrote: "Scientists discover the world that exists; engineers create the world that never was" (New Mexico Museum of Space History, 2013) and places engineering as a creative domain in which the search is through discovery. This is an interesting point as it also places creativity in engineering, which generally is thought to belong to the artistic fields only.

In architectural literature there are different approaches to how architecture is related to research. This is not surprising as there is still blurriness about the exact placement of architecture as a field in between science and art. As a result of this, which approach (positivist, hermeneutic, heuristic...) and what rules of research would be most appropriate for architectural research is frequently a topic of discussion. Types of research in architecture range from hard-core scientific research to artistic inquiry. The ambiguity of the type of research brings with it the uncertainty of the principles to be adopted for research.

Nowadays, the advancement of architecture is considered to be essentially linked to the acquirement of knowledge, which is achieved through research. Another aspect of discussion is what constitutes research in architecture (or design). At the same time, there are different conceptions of the potential topics of research in architecture. While the relationships between research and design are discussed, we come across the use of different kinds of terminology like 'research in(to) design', 'research for design' and 'research through design' by various scholars (Short, Frayling, Till, Rendell). These different concepts also imply different targets and tools. We will try to use these concepts as a way of grouping the diverse understandings of architectural research.

Sanford Kwinter talks about some problematic attitudes regarding the relationship between architecture and science. One attitude that he mentions is an unproductive form of narcissism that architects often suffer from. This attitude asserts that science is that part of culture that speaks about found reality, and is therefore somehow poorer than the disciplines that invent. Another problematic thinking for Kwinter is the disastrous approach to adopt a 'positivist' attitude within architecture, to see it as a 'science' in the classical sense. For him, it would be very misplaced to apply 'scientific method' to architecture and what is required today is to rethink science as well, to bring its spectacularly inventive side to the foreground. Kuhn's work helped to prepare the ground for a new understanding of science as being a generator of ideas and not only facts (Kwinter, 2007).

Jeremy Till wrote on the topic of architectural research and questioned the way it is perceived and the reasons for insufficient development in this field. In this context, he describes the three positions ('myths', as he calls them) (2008, 2012) that have evolved around architectural research, and which may have held back the development of research in the field of architecture. The first is that architecture is such a particular form of knowledge that it needs particular forms of research to investigate it or, at worst, cannot be subjected to the standard expectations of academia. The second position is almost the opposite, namely that architecture needs to be subjected to the methods of other disciplines if it is to be taken seriously as a form of rigorous knowledge. The third position is that doing architecture through the act of design is a form of research in its own right, and therefore architectural research should move from the academy and be located most firmly in practice (Till, 2012).

The positions that Till asserted might also explain the different modes of research in design. It is possible to draw parallels between Till's positions and the different modes of research in design, the first position of

Till being to take the particularity of architecture as its starting point to the concept of 'research in(to) design'. The second position, which gives dominance to the other disciplines feeding architecture, might be considered as the position of 'research for design'. The third position that is based on the idea of the act of designing as a form of research in its own right, is clearly what is meant by 'research through design'.

Alan Short asserts that the concepts of Frayling (1993), 'research for design' and 'research into design', inhabit the mainstream of academic research, whereas in fact there is a need for the introduction of another type of funding scheme to address these concepts. This kind of research would be oriented directly at the 'creative industries' to support and nurture much-needed research through design (Short, 2008). Till places the modes of research a little bit differently from Short, placing one of them in between the domains. He states that research 'in' (research into) design is traditionally the domain of academia and research 'through' that of practice, with research 'for' somewhere in the middle. He asserts that research 'in' has the most clearly defined methodologies and research outcomes, but at the same time is probably the most hermetic. Research 'through' is probably the least well-defined and often the most tacit but is at the time a key defining aspect of architectural research (Till, 2012). The commonality of views between Short and Till is that research through design is a newer concept and requires attention and funding.

Jane Rendell also mentioned a popular position among designers that the practice of architecture as a professional design activity involves some degree of research…by virtue of each unique 'journey of discovery' (Short, 2008). This is another statement that supports the importance of 'research through design'.

For Till, architectural knowledge lies to some extent in the building, but also in the processes that lead to the building, in the representation of the building and in the theories beyond the building, so architectural research must address this expanded field. He asserts that, along with these myths, architecture has its own particular knowledge base and procedures. This particularity demands us to define clearly the context, scope and modes of research appropriate to architecture, whilst at the same time employing the generic definitions of originality, significance and rigour (Till, 2012).

It is worth considering whether the 'myths' described by Till are actually ideas frequently mentioned by architects during discussions about architectural research. Did, for instance, the workshop on 'Doctoral Education in Architecture", as such a discussion platform, demonstrate a

similar tendency in terms of myths? It is possible to trace tendencies to a certain extent. Below are some quotations from the workshop:

Zuhal Ulusoy *"Scientific design as an output?" That's a question mark. We always tend to see the scientific part in design. There could be a reciprocal attitude to that question; asking the design aspects in the scientific research. Maybe that is a way of seeing the interaction between the two. Because, we always tend to see it from one side. With the growing innovations in all kinds of scientific research, I feel that there is a growing trend in terms of designing the scientific research itself. Maybe there could be a leap towards finding a meeting point, I don't know, a consolidation maybe.*

Gary Moore *I also agree and believe very much in the diversity. I do think however at the core, there is the outcome. We heard some words about original contribution to knowledge. So whether one student of PhD is very esoteric and far from practice it still, to be a PhD, needs to be an original contribution to knowledge, which then implies some other things about core of methods. It implies things about reliability, conformability, and transferability, that the knowledge is not just unique to one's mind. But that must be able to be replicated in some ways. So I think that at a deep level there are some core principles that an original contribution to knowledge has to satisfy, whether it is this way or that way*

Gülsün Sağlamer *I think all stakeholders in the system have to change their mindset.. Because we are facing with a lot of difficulties when we are applying for funding for our research projects in architecture and this is the case all over the world. There are a lot of bureaucratic steps for project proposals for engineering and science research projects. Engineering and science community are used to deal with this kind of bureaucracy, but we are having difficulties in this respect.We should try to adapt ourselves but at the same time we should be able to convince the other stakeholders to change their mindset. We are trying in fact to do something but because of these rules and barriers, we are doing something else at the end.*

Hans Beunderman *There is some underlying frustration from my time as a dean, where I found that the school as it were divided between two monsters. One being the practice and one being the university research committees coming by being accredited and valued as a part of the university. Increasing the university part is influenced by funding problems and the funding in Netherlands and I think also in EU programmes require certain research standard and history. Many of these criteria are generated from the applied sciences or the engineering sciences and we are not as good at that sort of criteria. So the frustration is that in many cases we did not have the possibility to enter into the Dutch funding programmes. It causes a barrier to entry because it is not in their benefit and they keep out new incomers. I tried to make that link between the faculties of architectural research. On the other side there is the practice, which is inconsistent. So, they are inconsistent in their*

requirements and those are the two poles that we had to balance between in the past decade.

Gary Moore *...the research money coming into the universities… In architecture, it is still, in most countries relatively hard to get large research grants into the universities. At universities you have huge research labs that are hiring many post-docs, other research staff, all the way up to research professor. Maybe not teaching, just research. We don't have such a tradition in architecture yet. Our graduates are looking for other universities to teach and do research at. So until our governments are willing to see that architectural research is valuable and needs financial support, I think we are trapped. Yes they want us to produce a large number of PhDs but there is no place for them to go.*

George Papakostas *The question of the doctorate studies and the doctorate as such as an output is the production of the architectural knowledge and architectural innovation. The question is who is actually producing architectural innovation. The academic institutions or the practice? In my view, practice is the dominant producer of architectural innovation. Schools of architecture, in the majority of their practices, they import knowledge, the architectural knowledge and innovation that are produced in the practice, and incorporate them into their teaching practices. So in my understanding, what is discussed actually, how the design could become the center of the research, occupation of the academic institutions is a new effort on the part of the academic institutions to contribute to architectural innovation.*

Gülsün Sağlamer *In this university, until I became the rector, the senate was using very strict rules about the publications and asking about ISI indexed journals and then it was not easy to convince all the engineers in the senate that, you know, architecture is different, so we have to accept internationally refereed journals not necessarily indexed in ISI. Then, from that time on, we have accepted internationally refereed journals for academic promotions and for all of the PhD studies as well. But we still have the pressure coming from the Higher Education Council, coming from technical university engineering departments. So it is not easy for a Faculty of Architecture to live in a technical university in a pleasant way. Not easy.*

Constantin Spiridonidis *The recent discussion risks arriving at the conclusion that the new generation of doctorates must have the main characteristic of collaborating with industry. I don't think that this is the most significant aspect of this new generation. Architecture is about creating space. But in order to do that, we need knowledge coming from humanities, about the human, about the people, about the society, etc. Our subject is creation. The others are supporting to that. The interesting thing is that all the themes of the doctorates that we experienced previously were based on these areas, which are supportive, but not in the centre of our profession and discipline and occupation. I think the interesting shift is the fact that now we are moving from these areas to the centre of our own activity. The difference now is that we have to step into design and look at it from this different point. We need a significant*