New Schools of Thought

An investigation on tendencies in architectural education

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ABSTRACT: This paper elaborates on the first findings of the ongoing research project NeST (New Schools of Thought), which investigates reactions to academic homogenisation within European architectural education. NeST defines a New School of Thought as a set of ideas and new approaches on methods of knowledge creation and forms of knowledge transfer, which a group of people who are dedicated to architectural design and spatial planning share about architectural education. Schools are no longer the only privileged place for thinking. New sites of knowledge production and reflection have arisen, giving way to new types of schools of thought. Through a multiple case study situated at the level of secondary education, higher education, and public mediation, this paper analyses the inherent concepts of new schools of thought and reveals their alternative routes as responses to tendencies in architectural education. This framework gives indications of potential impacts on models of architectural education.

1 INTRODUCTION

Architecture reflects, shapes, and enriches society and its culture. At the same time, it seems increasingly incapable to be influential in determining 'the course of things in space' (Eisinger 2008). At the most, it can be considered as 'a singular way of thinking about anything', being 'a diagram of everything' (Koolhaas & McGetrick, in: Eisinger 2008). It is exactly in this encompassing and indecisive way of 'being in the world' that architecture 'manifests itself as an instrument for exploring the world' (Eisinger 2008). Latour values architecture as a unique practical and visualizing tool that political language does not have (Ghosn *et al.* 2008). In its "singular way of thinking about anything", architecture – as a tool and an instrument – provides a unique lens which "preserves a view of the total" (Eisinger 2008).

Architecture is embedded in culture. With its traditions, it is inseparable from education. In architectural education, architecture is the pathway for self-formation. Teaching architecture is not solely teaching *about* the role of architecture in society. Its pedagogy consists mainly of *learning from* architecture and *educating via* architecture. In essence, it is teaching *in* and *through* the moment in which society manifests itself through architecture. What then is it that is taught? Or – as formulated by the Swiss architect and teacher Andrea Deplazes with an exhibition in the Schweizerisches Architekturmuseum in Basel in 2006 – "was studieren sie wenn sie Architektur studieren?" Indeed, architectural education cannot be considered as mere vocational training towards professional proficiency. Given architecture's inherent responsiveness and sensitivity to societal change, its capacity to critically conceive new futures as creative responses to current conditions, and since architecture acts as a unique *practical and visualizing tool* and as an *instrument* for *exploring the world, preserving a view of the total*, architectural education provides rich grounds both for self-formation of the individual student and for critical reflection and transformation of society as a whole. In times of rapid changes and societal challenges which lead to uncertainty and complexity, one could argue that architectural education is providing society with schools which feature a certain "cunning of uncertainty" (Nowotny 2015) while embracing contingency and complexity.

Architectural education has many roots. Apprenticeship on the building site, pupillage in the office, Beaux-Arts training in the academy, engineering lessons in the polytechnic school, and – more recently, owing to the ascent of cultural studies and critical theory – a master's degree at the university. Each of these approaches has been challenged. Europe's recent higher education reform has tended to advocate the university as the ultimate place for higher education. But is the university the optimal biotope for architectural education to flourish?

1.1 *The university as a place for architectural education*

The university is a particular institution in that it hosts both research and education. Its legitimation to provide academic higher education consists of this proximity to research. This idea originates from the beginning of the nineteenth century, with the foundation of the University of Berlin as an icon for the modern European university. Since then, the public role of the university has been fundamentally questioned several times. Two centuries after the founding of the first university, at the turn of the twenty-first century, there is a widespread consensus in academia and society that the mutual relationships between science and society (including economy and politics) have drastically changed (see e.g. among many others Delanty 2003, Simons et al. 2007). The evolution towards mass higher education and the rise of the knowledge society, accompanied by the emergence of a knowledge economy, have transformed the relationship between science and society, the role of research, and the identity of the university as a place where research and teaching coexist. Higher education no longer addresses an intellectual elite. Since the university is *democratised*, it has not only delivered many cohorts of graduates, it also has delivered cohorts of knowledge producers, generating and exchanging knowledge in a variety of sites and contexts. The university has lost its privileged position as knowledge producer. The university gradually becomes acknowledged as a place typified by its limitations and restrictions in the conduct of research – narrowed to emphatic interpretations of scientific research – rather than pictured as the place par excellence where teaching is embedded in the most thriving and intensive research environments available. This is particularly the case for architecture and architectural education.

Architecture is connected to many disciplines and knowledge fields – it is "boundary work" (Kurath 2015). This boundary condition manifests itself at least in three ways. (1) Being in a margin of the scientific environment of the university, merely contributing to the academic body of scientific knowledge, architectural education takes a defensive stance. Academisation makes architectural education operate in a climate of confusion and pressure (Gisler and Kurath 2015). (2) In this boundary condition, architecture acts as a connector. It connects many disciplines, and it gets many actors involved (both human and non-human) (Yaneva 2012). (3) Given the fact that new knowledge is created at many sites and in many contexts, given that architecture is connected to many fields and many types of knowledge, and given the specificities of the type of research conduct actually fostered by the university, it is hard to assert that the university – as it operates today – would provide the most appropriate conditions for architectural education.

1.2 *Architectural education in times of homogenisation*

In 1988 the *Magna Charta Universitatum* was proclaimed by the rectors of European universities. It referred to the coming abolition of boundaries within the European Community in the next four years. In 1999 the European Union's Bologna Declaration was defined "in order to enhance the employability and mobility of citizens and to increase the international competitiveness of European higher education" (European Ministers of Education 1999). Together with both European qualifications frameworks – the QF-EHEA, or *Bologna Qualifications Framework*, and the EQF-LLL, or *European Qualifications Framework for Lifelong Learning* – and European Directive 2013/55/EU, it was a milestone towards comparability of European education. However, it is also seen as the starting point for academic standardisation which, from an academic point of view, could potentially result in "Verschulung" and "didatticizzazione", "rigid and compressed curricula", "with less space for creativity and innovation", less time for "independent research or study, critical reflection, fostering of an independent mind" but instead "greater efficiency and delivery" (Froment *et al.* 2006).

Reichert & Tauch (2005) designate the added value of the Bologna reforms as the "internationalisation of study programmes", "increased mobility", and the "improvement of international communication. This reform takes place in circumstances of increased competitiveness, contributing to it at the same time. Academic institutions are required to become more self-sufficient and thus entrepreneurial, raising more third party money, particularly for research (Smith 2010). As a result, private academic institutions and excellence clusters within public academic institutions develop as an alternative and open up "the economic discourse about the value of education" (Verwoert 2007,Hochmuth and Mangold 2012).

Architectural education in Europe has been a kaleidoscopic landscape, reflecting differing roots and cultures. The higher education reform, which started in the 1980s, contained strong preconditions for homogenisation. These processes have reached their full development and maturity today. Learning outcomes, subject-specific competences, institutional evaluations, professional accreditations/ regulations, research assessments, etc. have developed a strong grip on all higher education, including architectural education.

1.3 *New schools of thought*

The Bologna process is not to be seen only as an educational reform. It has to be understood as a response to a changing world. Delanty (2003) concludes that the post-industrial knowledge society – consisting of services rather than of production – is increasingly driven by communication and information technology. The post-industrial knowledge society is not a European but a global society, in which the separation between knowledge and economy has blurred, giving way to the "scientisation" of society (Delanty 2003). Facilitated by the Bologna process, knowledge production and education are turned into globally marketable products (Kurath 2015). Since the late twentieth century, architectural education in Europe has been reshaped by these conditions of digitalisation and internationalisation, which have brought forth tendencies of *scientification* and *commercialisation*. Within these circumstances, architectural institutions have undergone changes in content and in methods of knowledge creation and transfer, as well as shifts in organisational structure.

How much these processes have effectively homogenised architectural education and to what extent formal adaptations to superimposed structures are simply masking submersed resilience of pedagogical traditions is not clear. It can be observed, however, that several initiatives have emerged as alternative routes of education, all of which comply with what we identified as *New Schools of Thought* – a set of ideas and new approaches on methods of knowledge creation and on forms of knowledge transfer, which a group of people who are dedicated to architectural design and spatial planning share about architectural education. These initiatives illustrate that there is an urge to expand the current scope of architectural education. They operate under a diversity of circumstances, address other audiences, involve other disciplines, and adopt a variety of methods for sharing insights and disseminating knowledge.

The research project NeST investigates these alternative routes, which – like Derrida's (2001) "university without condition" operate as battlefields of theoretical discourse with academic and unconditional freedom, sovereignty, democracy, and resistance.

2 RESEARCH INTEREST

Jenson (2014) criticises "the conventional educational structure of design and architecture schools" and suggest that "the global changes to education demand the necessity for the emergence of a new type of reflexive educational space" apart from the mind-bordering classroom. In accordance with Jenson's argumentation, NeST will investigate such new types of *reflexive educational space*. Studies on architectural education focus mostly on formal higher education at the university or at a school of architecture. This focus does not allow for grasping the many initiatives which emerge elsewhere, and which – deliberately and with great enthusiasm and conviction – present architecture as a means to explore the world, for the personal development of their audience and as an "offer being made to society" (Eisinger 2008). Therefore, NeST takes a comprehensive stance, open to include a diversity of initiatives which address architecture as a medium for learning (about the world). It widens the term "school of thought" in terms of scope, place, and audience. In addition to universities and schools of architecture, it includes institutional think tanks, networks, and platforms (both physical and digital), etc.; it includes *formal* as well as *non-formal* learning, and it includes all stages of learning, from childhood education to lifelong learning. The research project NeST views these schools as possible social and cultural innovators. It aims at uncovering the motivations, goals, innovative approaches, and ranges of these schools of thought. By including these schools of thought, NeST aims at broadening the debate on architectural education by expanding the scope of approaches taken to address the challenges of societal and environmental change – through architecture.

3 RESEARCH DESIGN

This paper reports the first findings of an early stage of the project, which rely on an empirical study consisting of the analysis of multiple cases (Yin 1994).

The study concentrates on the European context. Within this limitation, cases were selected based on three parameters: (1) the chosen case had to be understood under the definition of a *new school of thought*, (2) the initiative must have arisen after the educational turn in Europe in the 1980s, and (3) the initiative has to provide new approaches for knowledge creation and for sharing insights to a public audience, in and through the field of architecture and spatial planning.

Cases were found, either through their prominent appearance in the media, or through the networks of the partners of the NeST-consortium. Twenty-one initiatives have been designated for further investigation, of which eleven have responded. After a concise screening of the documentation available online, a qualitative online survey has formed the study's most substantial body of information to date. The aim of this survey is ideosynchratic: it is not looking for generalisations, but aims to reveal a rich pallet of diverse characteristics,

approaches, and stances of innovative and thought-provoking approaches with regard to architectural education. Representatives of the chosen initiatives have responded to three thematic clusters, which were based on a review of the literature. The first set of questions asks about the reasons behind the creation of the initiative, its main characteristics and the challenges faced in running it. The second part of the survey maps the target audience and the scope of disciplines which are involved, as well as the methods and techniques used for knowledge creation and mediating the work to the public. The third and last section explores how and to what extent the school of thought positions itself towards the tendencies of *commercialisation* and *scientification* – tendencies which emerged from the literature review as determinants of the current educational landscape. The aim of this third part was not so much to confirm or estimate the significance of the tendency, but to map the diversity of routes that have been taken in relation to this tendency as a factual condition, identifying the particularity of each approach while giving special attention to the context in which the initiative operates and to which it responds (Mortelmans 2011).

Responses have been received for the following eleven cases, which have been designated for further investigation: Architecture Workroom Brussels (AWB); ADAPT-r; aut. Architektur und Tirol (aut); bink; Bundesstiftung Baukultur (BB); Estonian Academy of Arts, Faculty of Architecture (EAA); Spacespot; TRANSark; University of Sheffield, School of Architecture (UoS); University of Reading, School of Architecture (UoR); Vorarlberger Architektur Institut (vai).

4 FINDINGS

The following section will firstly explain the mind-sets within the typological framework of the cases in order to then elaborate on their responses and alternative routes set out in response to tendencies in architectural education. When examining the aims rooted in the mind-sets of the different cases, it becomes obvious that within architectural education, certain types have evolved which can be clustered by their target groups: secondary education, higher education, and public mediation. Within those three types, one can clearly identify coherent (meaning homogeneous and logical in its system of thought) and at the same time distinctive (when comparing with other traditions or entities of thought) mind-sets. It is important to note that individual cases are not necessarily bound to one typology; they may be comprised of a mix. For instance, vai operates in the realms of secondary education and public mediation. The aim of this section is to present the inherent concepts of the three different typologies. This will form the basis for understanding their reactions to the multiple tendencies within architectural education, which are presented afterwards.

4.1 *Mind-set within the topological framework of architectural education*

Within secondary education, the NeSTs participating in the survey intend to create a network which links architects and schools. Another aim is to implement architecture as a subject in the school's curriculum. This shows that architecture is not yet established as a teaching subject. Hence, the initiatives have to fight for their existence. Nevertheless, they emphasise the positive feedback they get from architects, teachers, and children for their approaches. They are aware of the importance of their work: "young people are the decision-makers of the future. They will contribute to our built environment as politicians, clients, or the like" (Spacespot). Therefore they emphasise the importance of increasing sensitivity for the built environment among students, teachers, and parents.

Within higher education, the NeSTs participating in the survey have aims which vary in *content*, *method*, and *attitude*. Concerning content, issues such as climatic change, economic crises, and large-scale environmental crises all challenge our planet and "call for a rethink in architectural education" (TRANSark). Concerning methods, there is a desire to "close the gap between academia and practice while creating space for reflection on both" (UoS). One can identify the intention to bring back "critical thinking, reflection, and an evolutionary approach" (UoS). Furthermore, the University of Reading intends to "make it a multi- and interdisciplinary environment around understanding, designing, and managing the process of buildings". However, the applied methods of knowledge creation and forms of knowledge transfer vary significantly among the different schools of thought and will be elaborated upon further. Concerning attitude, one can make out a strong social ethos that links the initiatives within higher education.

Within initiatives of public mediation of the NeSTs participating in the survey, the general assumption is that sufficient discussion and action is lacking on the built environment, building culture, and the building process. Hence, the general aims within this typology are (1) to raise political and interdisciplinary discussion about the built environment, building culture, and the building process, (2) to create a broad network, and (3) to develop pertinent and meaningful responses to crucial societal challenges.

The different approaches are nevertheless distinct when looking at their point of departure. Aut intends "to develop a societal and legal basis in order to improve the living environment". In contrast, Bun-

desstiftung Baukultur already fought for their political influence: In October 2014, the German Federal Cabinet dealt with the first Building Culture Report 2014/15 developed by the Bundesstiftung Baukultur (2015). This report had then been forwarded to the German Parliament and Bundesrat as basis for legislative draft.

Through literature and the answers given to the survey, certain tendencies in architectural education have been identified. The following paragrpahs will elaborate on the NeSTs' responses and the alternative routes they have set out in response to those tendencies outlined here as sub-chapters.

4.2 *Responses to tendencies within architectural education*

4.2.1 *Several gaps in architectural education*

There is a common need to close several gaps between (1) academia and practice, (2) public awareness and financial support for the initiatives, and (3) architecture and pedagogy.

In order to close the gap between academia and practice, the situation calls for, on the one hand, "the development of a new level of pedagogical practice which requires dual-role professionals, that is, professionals who are as skilled in their discipline as they are with academic teaching abilities" in order to confront societal challenges (TRANSark). On the other hand, new forms of knowledge creation and transfer have been tested by the initiatives. University of Sheffield School of Architecture, who is the initiator of the Live Projects programme and the Live Works initiative in the UK, emphasises collaboration and participation between the civic community and students: "The motivation behind setting up Live Projects was to give students an opportunity to learn through doing – to actively experience the connection between theory, practice and community engagement. We were aware of the disconnection between our teaching, via studio work and lectures, and the socially-engaged ethos we promote. Live Projects close the gap between academia and practice while creating space for reflection on both" (UoS).

This approach can also help in closing the gap between public awareness and financial support for the initiatives. By simply including sponsors in the creative process and at the same time widening their audience, the new schools of thought achieve acceptance and financial support.

In order to close the gap between architecture and pedagogy, pedagogues (being professionals in mediation) and pedagogical theories and methodology should inform educational programmes for architecture (Spacespot, bink, TRANSark). Additionally, TRANSark uses a limited set of courses as "testbeds for didactic experimentation" which are later being internally discussed through seminars and evaluation.

4.2.2 *Inability to find a language for architecture*

There is an inability to communicate design strategies and to find a language for architecture in spoken words, images, and spaces in order to mediate to people outside the discipline and to support the profession. "The 'architect' has contributed to her own marginalisation for many years by allowing other disciplines to take over large and vital parts of the processes producing architecture. Even for core aspects of our profession, such as creativity, other disciplines such as design have developed a much stronger rhetoric and narrative, placing designers in a more potent position with *design thinking* than architects with *XXXX*. There is a strong need for research, development and formulation of our contribution in society" (TRANSark).

As a reaction to this tendency, the initiatives increasingly make their work public in order to mediate to a wider audience outside the discipline and to support the profession. Their methods of inquiry vary widely. They establish a constructive dialogue through internal and public "dialectic debates" (aut), a public "atelier" (AWB), or "excursions" (vai, bink). Bundesstiftung Baukultur conducts polls to find out what public authorities and private persons think about building and planning. This is incorporated into a biannual report about the state of building culture in Germany (Bundesstiftung Baukultur 2015). Vorarlberger Architektur Institut emphasises "communication at eye level" as a general means of architectural mediation. Certainly, many of the initiatives also conduct marketing in various media, such as journals, magazines, or radio, yet aut uses *space* as a common language to mediate to the public. The institute designs exhibitions "developed as specially conceived architectural projects synaesthetically designed so as to directly convey what is involved in the work of the exhibiting artists". This reaction can also be understood as an alternative route to counteract the following tendency.

4.2.3 *Scientification and digitalisation weakening the quality of architecture as physical and embodied matter*

Scientification and "increased digitalisation may influence the understanding and quality of architecture as a physical and embodied matter" (TRANSark) leading towards a shift in the content studied and the tools used.

As a reaction, aut implemented the project "bilding" (bilding 2016), an art and architecture school for children built by 27 architecture students over two semesters. Through this hands-on project, students got insights into "dirty reality" (aut) and craftsmanly topics. Furthermore, the initiatives recommend to promote interdisciplinary dialogue,

providing building and planning as a culture of general interest (BB), and to introduce the socio-political focus of basic architectural themes in the debate against "digital formalisation and pseudo-sciences" (aut).

4.2.4 *Scientification*

Scientification of architectural education has led to (1) an ongoing discussion about knowledge production in architectural research, (2) the demand for appropriate evaluation and validation techniques for architectural research, and (3) competition in regard to research outputs. Controversies regarding these issues have impacted education.

The increasing emphasis on research in higher education has provoked architectural education to stimulate more staff to do research, and to put a greater focus on knowledge production. The ADAPT-r project can be understood as a result of such a process. This tendency has also led to an increasing variety of teaching and learning formats. In order to inform architectural education with "good quality research" (UoR), new methods such as research-led studios (EAA, TRANSark, ADAPT-r, UoR) were introduced, which combine the techniques and content of research and studio designs. This potentially develops into architecture-specific research methods like research by design. In the long term, this can lead to "a consistent theoretical and methodological framework for pushing our didactic development further" (TRANSark), and hence it can help overcome the necessity of boundary work (Kurath 2014). The Faculty of Architecture at the Estonian Academy of Arts, however, warns that design-based research models need to be accepted by the responsible institutions and not be subordinated to pure academic writing.

Consequently, there is a demand for useful evaluation and validation techniques in architectural research and teaching. Since "architectural research is still a young research field and has provisionally to lean on other disciplines for methodology and funding" (TRANSark), the initiatives use synergies coming from the cooperation and discussions with other disciplines: "Architectural production has become increasingly regulated from the side of legislation and demanding from the expectations of both the technological and financial performance as well as the cultural and intellectual adaptability to the changing needs of the society. These increasing demands cannot be faced by one professional nor addressed by one single curriculum, but signal a need for a wider interdisciplinary collaboration" (EAA).

In order to keep pace with the competition in regard to research outputs, the initiatives increase credibility by mediating to an academic audience (through papers, conferences, etc.) as well as to a practice-based one (through lectures, exhibitions, journals, and magazines). Additionally, they aim to gain resonance through discussions with invited practitioners and others (UoS, UoR). As a result, the initiatives become interesting for young, experimental practitioners (EAA).

4.2.5 *Commercialisation*

Commercialisation in architectural education has led to (1) a shift from the qualitative value of creativity to an economic one, (2) greater dependency on financial supporters, (3) pressure on the organisational and administrative management of institutions, and (4) a decrease of critical thinking, reflection, and innovation.

Marketing is used as an answer not only to increasing competition in regard to research outputs but also to commercialisation leading to a shift from the qualitative value of creativity to an economic one. The initiatives need to be understandable for and communicative to a wider public, and hence they are challenged by an "increasing pressure for simple messages and nice pictures for the media" (EAA). In order "to highlight the creative role that universities can play in the development of their home cities", the University of Sheffield School of Architecture created the Live Projects programme. Naturally, this has led to increased collaboration with and hence funding by external partners, and turned their dependency on financial supporters into an interrelationship with external partners. Real live projects have the potential to turn commercialisation from a pressure and a threat into an opportunity for learning: "In our education we approach commercialisation by involving the students in real live projects in the framework of 'live pedagogies', allowing the student to 'learn the game' in small scaled 1:1 deliveries. We are also developing platforms for entrepreneurship competences enabling the students to engage with stakeholders in society" (TRANSark).

As a reaction to commercialisation leading to pressure on the organisational and administrative management of institutions, the initiatives within higher education are pushed to decrease student contact in order to create more time for research, to cut back on space and resources allocated to teaching, and to increase fee incomes and student numbers.

"The core values of architectural education as a generator of innovation and critique of the discipline and profession are being eroded. Design skills cannot thrive within an environment of commercialisation where efficiencies of space and resourcing are prioritised over quality of the creative environment. It is very difficult for students and staff to make time and space for risk-taking, experimentation and reflection in the design process. Outputs are becoming more homogenous and predictable because of this – innovation is being squeezed" (UoS). As a reaction to this tendency, the initiatives foster different methods of learning. University of Sheffield School of

Architecture introduces mutual learning between students and an interdisciplinary community (clients and the public) in order to offer "an opportunity for critical thinking, reflection and an evolutionary approach to project and design development" (UoS).

TRANSark "investigates the transformative aspects of the learning experience when students, exposed to extreme complexity of aesthetical, ethical, technical, economical, and functional challenges as they become architects."(TRANSark 2016). Additionally, the initiatives stress interdisciplinarity as a source for complex, lateral, and creative thinking: "This can't be replicated within the institution – students need a public audience to be able to gain feedback and critically reflect upon their skills, their role and how they can make a difference to society in meaningful ways" (UoS).

5 CONCLUSIONS

5.1 *Tendencies*

This first approach to identify tendencies within NeSTs has been done in a heuristic way. The study of the cases served to expose their main driving forces, objectives, attitudes, and target groups in architectural education. These have been explored further within five tendencies and ways of handling them. (1) There seems to be a breach between architectural academia and practice as well as a mismatch between financial support and public awareness. These circumstances which ask for new instructional approaches and skills. (2) The lack of a common architectural language (spoken words, images, and spaces) makes communication with a wider public difficult and leads to misunderstandings about the architecture profession. In response to this lack, work results are increasingly expected to be formatted and mediated to an audience outside the discipline of architecture. (3) Moreover, the value of architecture as physical presence appears to be repressed by an augmented scientification and digitalisation. This has a direct impact on the topics studied and the tools used. (4) Scientification of architectural education has further led to ongoing discussions about knowledge production, demanding appropriate evaluation and validation procedures for architectural research. It also has contributed to a growing competiveness in regard to research outputs. (5) Commercialisation is increasingly leaving aside the qualitative and formative value of architectural education, focusing instead on the economic one. Academic institutions compete against each other through the amount of research they produce. The quantity of research done by the universities is also used to recruit students. Frankly speaking: the better the research and the higher the ranking of the university, the more students enrol (UoR). This provokes ongoing pressure on the organisational and administrative management of institutions, leading to financial dependencies and decreasing the possibility of critical thinking, reflection, and innovation. Responses to these challenges include decreased student contact time, cutbacks on spaces and resources allocated to teaching, higher fee incomes and student numbers, and an emphasis on different methods of learning, including an interdisciplinary community. Hence, the initiatives do not only include other sciences, such as the social sciences (architecture and planning, media and communication, economics and business, geography, sociology, psychology etc.), the humanities (arts, cultural studies, literature, archaeology, philosophy, religion, etc.), and the technical sciences (engineering, software and hardware developers), but also medical and health sciences (medicine, neurosciences etc.) in order to provide deeper insight into the interrelations between perception, thinking, and action.

Although the findings of the tendencies contribute to a first understanding of NeSTs, additional in-depth studies of the correlations between the tendencies are planned.

5.2 *Research in architectural education*

As a consequence of the Bologna reform, and the academisation process which it induced, architectural education was expected to strengthen its research orientation. An ongoing tension has arisen between research in architecture, drawing on methods and ontologies borrowed from other disciplines – research into architecture – and attempts to develop design research and practice-based research up to the levels of a recognised academic methodology – architectural research (Crysler *et al.* 2012). Architectural research is a contested concept. In order to give exposure to its existence and to advocate its potentials, the European Association for Architectural Education [EAAE], felt a need to write a Charter on Architectural Research (EAAE 2012). Our future investigations will expand the scope of typologies to include research-oriented NeSTs and focus on tendencies within research in architectural education.

5.3 *The role of space in architectural education*

Finally, the spatial component of NeSTs will be a subject of future research. The sprawl of knowledge sites makes teaching through and learning from architecture now appear in a variety of places, ranging from the typical classroom over exhibition floor, discussion platforms, think-tanks and transdisciplinary networks, to virtual spaces as blogs and websites.

In times of digitalisation, an educational space may no longer be confined to physical walls but may

expand into digital space, where a set of rules for the regulation of pedagogical interactions and communications forms an alternative learning environment. As Latour (1983) explains, the whole society is turned into a laboratory, "there is no outside of science but there are long, narrow networks that make possible the circulation of scientific facts."

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