COMPETENCIES REVISITED
AN EDUCATIONAL APPROACH TO CONCEPTUALISE PLANNING
AS A BOUNDARY DISCIPLINE

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The paper presents a systemic view on the purpose and impact of planning education. We introduce a system model, which bases upon the assumption that the objective of planning education is equipping students with competencies to resolve current and future challenges. Planning education has always focussed on instruments for this purpose. Among other reasons, established statutory instruments have become less effective in steering urban development due to a shift of power from public towards private stakeholders, e.g. in terms of funding. Thus, we propose a shift from formal qualifications suited for public planning control towards a problem-based and impact-orientated approach. The educational term 'competence' serves hereby as a measure of employability.

The 'wicked' nature of planning problems distinguishes knowledge in planning. Knowledge is contextual and constantly transforming. It can however be deconstructed in a defined context. Then, we can assign an observable impact to a certain state of problem or intervention. These constructs of knowledge can help us to make informed decisions. The challenge is to apply and transform these contextual constructs to other settings. This requires proficiency in analysing, evaluating and creating constructs. Public planning control and its instruments consist of normative goals, which dictate the reason and extent of planning. In case of a problem-based approach, it is the role of a planner to recognise situations, in which his knowledge helps making an impact towards intended futures.

0. Introduction

The paper presents a systemic view on the purpose and impact of planning education. The introduced system model serves as a foundation for a framework for designing 21st century planning curricula. A new approach to curriculum design in planning seems to be desperately needed as a rapid diversification in degree programmes over recent years demonstrate. In section 1, we trace back this diversification to fundamental changes in employment structure and a loss of importance of public sector as well as an increasing complexity of planning challenges due to the wickedness of social policy problems and the lack of an underlying disciplinary conception. As a result, educators have developed a pick-and-choose mentality selecting a variety of learning contents without any standards. The common ground of planning has shrunken down and employers are confronted by varying unlike qualifications.

In section 2, we hypothesise that a competent use of knowledge will become more important for employers than formal training in using statutory planning instruments. The concept of competency supersedes formal qualifications as measures of employability. The paper will investigate the term's use in context of European Higher Education Area (EHEA) and operationalize its meaning in order to be used as an aid for selecting the knowledge to be taught in class. We argue that hereby schools can design curricula with the intent to solve current and future challenges. This requires the selection of

‚powerful' disciplinary knowledge. Evidence-based content selection replaces hereby the existing normative pick-and-choose practice. This does however require conceptualising planning as a boundary discipline, in which evidence-based disciplinarity and impact-orientated transdiciplinarity complement each other.

Section 3 discusses potential implications for the educational practice. We question the existence of consecutive bachelor-master-degrees in planning as they focus on normative concepts with a significant lack of scientific evidence. Instead, we propose that schools should teach urbanism on a post-graduate level. Urbanism bases on all spatially relevant disciplines. Urbanism education then focuses on equipping graduates with the competence to combine constructs of knowledge from a variety of disciplines.

1. Research Background

1.1 Diversification of Planning Education

The first professional degree programme in planning emerged in the early 20th century. "Initially just a few institutions offered planning degrees at postgraduate level" (Frank et al. 2014: 33). The education followed the ideology of an engineer-planner (Frank et al. 2014: 38). The University of Liverpool's degree in civic design among others at University of Karlsruhe and University College London were post-professional degrees founded around 1910 (Frank et al. 2014: 37). Students had been practitioners in architecture or civil engineering before. The development of these programmes is closely linked to the establishment of professional bodies and advanced vocational planning. The underlying mentality of planners as engineers goes along with early modernist planning theory.

Modernism stands at the end of the long-term believe of constant advancement. Many scholars have conceptualised this myth of modernisation, similarly to architectural theory, in form of movements or historical periods with distinct normative concepts. Albers (1993) describe four phases starting in the late 19th century with planning adopting to social, economical and ecological effects of industrialisation and ending with planning developing prospects for the future since the 1980s. Selle (1995) generally agrees with this conception, however, adding the notion that these phases each develop an own layer of knowledge, which continues to be relevant until today. Both scholars share the view of constant advancement. As "most planning practitioners and scholar lived primarily in 'national' planning policy cultures" (Healey 2012: 192), these concepts claim to have universal validity. Albers and Selle mainly draw their view from spatial planning practice in Germany. And indeed, German planning has developed a growing arsenal of instruments and legal mechanisms with the intent to prepare for current and future challenges. They all base on the German federal planning law (BauGB), which haven't had any major renewal, only several additions and remain in its core the same planning system. Putting urban planning into a wider context and looking besides statutory planning, we will however see major breaklines in planning practice. Schönwandt (Schönwandt 2008) identifies two of these breaklines (cf. figure 1). Until the mid of the 20th century, planning has been based on the idea of rationality. McLoughlin (1969: 81) describes planning as the regulation of errors appearing in a 'machine-like system'. Rational planning theory characterises cities as comprehensible systems. Planners can foresee and evaluate all possible developments and weigh up assets and drawbacks of each planning solution. The understanding of planning clearly stands in the tradition of engineering and hits its peak with modernism in the 1960s. At that time, "a critique emerged that the planning and design of the modern cities was blueprint of placelessness, of anonymous, impersonal spaces, massive structures and automobile throughways" (Ley 1987). Consequently, the community of urban thinkers abandoned the rational-modern idea.
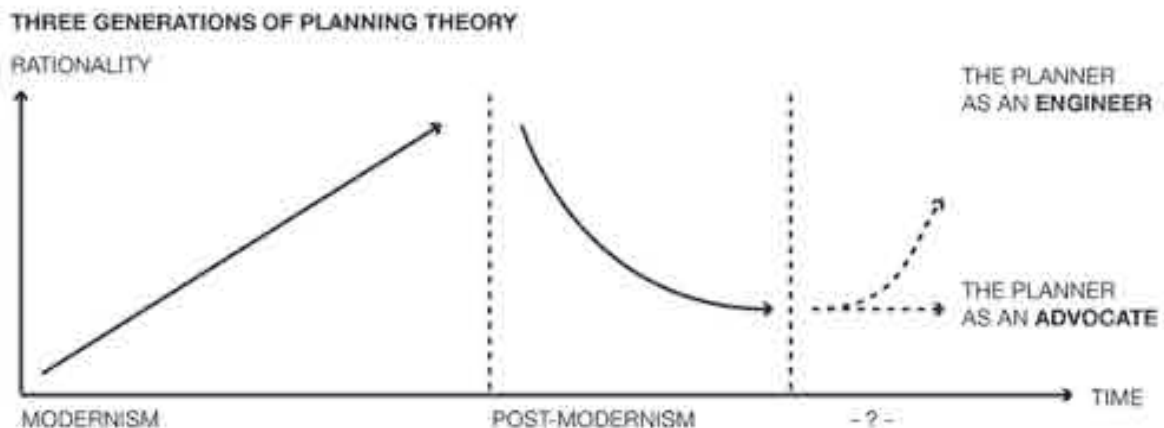
Figure 1. Three Generations of Planning Theory. Author's graphic

At that time, planning emerged as an independent discipline. Planning had "received a considerable boost […] as part of the reconstruction and rebuilding efforts post WWII" (Frank et al. 2014: 33). The growing demand for planning but also the growing critique of the engineer-driven modernist cities led to the establishment of the first independent planning department at TU Dortmund in 1969. The formation was in the time of the 'radical' 60s. Major societal changes occurred. So-called 'reform'-universities stood out due to flat hierarchy, autonomy of student administration and the decline of academic authority. In many ways, independent planning degrees adopted post-modern ideas and cultivated debate and critical discourse.

Schönwandt (Schönwandt 2008: 13) defines postmodernism by its critique of the rational planning theory. An underlying general theory of planning doesn't exist. The discourse has largely split within the architectural urban design and the planning community. Many architects rediscovered the city as a liveable urban environment trying to achieve the valued and appreciated qualities of pre-industrial urban form again (Ellin 1996: 11). Urban development in the suburbia remains however dominated by an automobile-friendly mode of planning resulting in massive urban sprawl in the US and a growing extent of functionally interlinked urban regions in Europe. Ellin (1996: 223) therefore concludes: "While contemporary urban design largely breaks form the modern project in theory, its implementation is nonetheless embedded in it." Many scholars try to overcome this contradiction in planning and design theory. At this point, Schönwandt (2008) identifies the second breakline and proposes fundamentals for a third generation of planning theory. He is not alone in his search for a new 'theoretical orientation' for planners. Innes (2014) for example considers "the dividing discourse of planning theory […] counterproductive".

Because post-modern planning failed to develop an underlying general theory, the recognition and acceptance of planning as an independent discipline remained in question. Planning degrees could neither claim technical nor scientific expertise. Instead, most curricula combined some core techniques of related disciplines with a normative debate about planning policy. A report of the American Planning Association (APA) from 2007 shows that independent planning degree led to a significant loss of speciality knowledge in many relevant fields (Hoch 2012: 130). An average APA graduate only obtains 50% of the knowledge about subfields such as infrastructure, labour force development and urban design compared to other peers with a more specialised education. After initial growth, the number of programmes stabilised with 9 degrees in 1999 (Frank and Kurth 2010: 27). Even in Dortmund, the current academic debate between leading figures of the architectural and the planning

department demonstrate the on-going dispute about the role and principles of planning (q.v. Höing et al. 2014; Altrock et al. 2014).

Besides the engineer- and the independent planner, a third model of planning education originated from social sciences such as geography, politics, or law (Frank et al. 2014: 84). Many geography programmes offer specialisations in the field of public policy, land division and urban planning. Similarly to the engineer-planner, the social science-planner can be regarded as an expert in its field, especially public law and administration. In Germany, this mode of planning education dates back the Prussian public service. Thus, its is primarily present in Northern Germany.
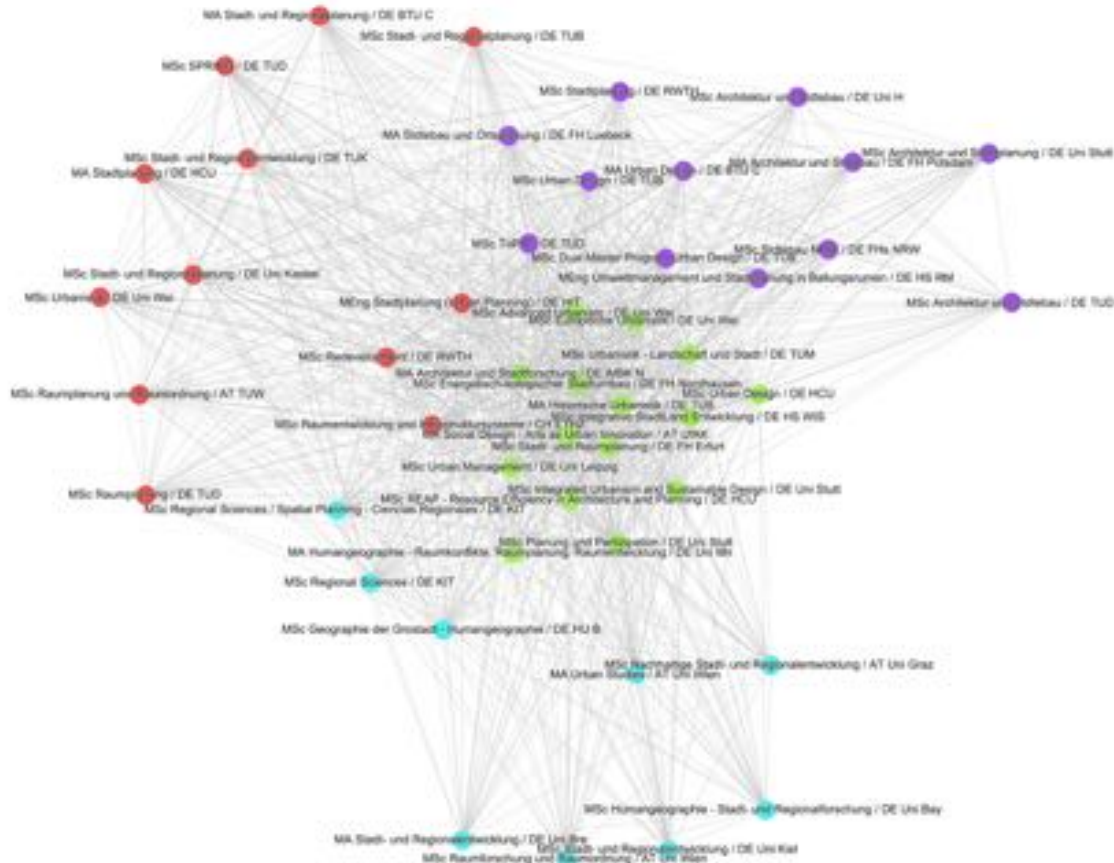

Figure 2. Network Diagram – Postgraduate Degrees in Planning – Proximity Represents Common Fields of Study Admission Requirements. Author's Graphic

Figure 2 shows the continuing presence of all three educational ideologies in the German-speaking countries. The network graphic bases upon the field of study admission requirements for postgraduate planning degrees. Our study includes all programmes explicitly addressing urban issues within their name. We collected data from study regulations from late 2014 to early 2015. Each node represents a study programme and the edges the number of common fields of study, which enable admission. The closer two programmes are, the more fields of study are shared as admission requirement. The results show that only a quarter of all graduates, which become potentially prepared for jobs in urban planning and design, come from universities with independent planning degrees. These are represented in red at the upper left corner. Independent planning degrees usually require an undergraduate degree in planning. As a result, they share less fields of study for admission with other degrees and are situated at the edge of the graphic. "Aside from the independent planning degree

programs, a plethora of new non-consecutive master's programs were also established" (Frank and Kurth 2010: 30). Degrees based in architecture and engineering are represented in purple and degrees in social sciences in light blue. Programmes, which are represented in green, allow access from a variety of undergraduate fields and can be considered as interdisciplinary in this respect.

In summary, planning is a diversified field of professionals with varying educational backgrounds. Planning roots back to engineering and social sciences and hadn't established itself as an independent discipline before the 1970s. Recently, many new planning degrees have emerged as part of a renaissance of engineering- and social-science-driven degrees as well as programmes, which are situated in between the boundaries of disciplinary fields. Today, we find a pick-and-choose mentality of content among educators. Instead of having standardised curricula, students obtain a variety of different competencies. Degree A may differ dramatically from degree B. One community of scholars may regard knowledge about urban form and composition as crucial (Höing et al. 2014), others promote focussing on the process of planning itself (Altrock et al. 2014). A recent empirical study by Christensen (2015) demonstrates also these different priorities within the group of planners. She finds out that practitioners regard „both process and outcome essential for planning" (Christensen 2015). Howe (1980) conducted a study about the perceived role of planners. 50% of American planners perceived their role as either technical or political. The other half does however classify themselves as 'hybrid' planners. The network of planning degrees shows a similar picture. The following two sections try to explain this present diversification.

1.2 Shift of Power

In recent years, planning has experienced a significant shift of power from public control towards private interest. Our planning system dates back to the beginning of the industrial society. Early planning theory - as outlines before - concentrated on mitigating negative effects of private industrial activities for living conditions. „Chaos has [had] entered the city" (CIAM 1933). Planners existed to bring order. This idea is strongly embedded in our statutory planning system based upon the separation of land-uses. Albrecht (Albrechts 2004: 754) argues, that these "established forms of planning [...] manage to ensure that undesirable developments do not occur, but [...] they are not able to ensure that desirable developments actually take place where and when they are needed".

„In the new knowledge economy, cities have found a new significance as nodes for innovation and communication" (Madanipour 2006: 180). Cities concentrate power, knowledge, communication and status (Danielzyk 2008: 36). „A sophisticated [private] market is interested in better-quality products [cities]. […] On the one hand, the process of economic liberalization has taken away much of the state's ability to shape localities directly, as production of space is essentially within the remit of the private sector. Hence, the private sector at the local and the regional level has found a more significant role in the governance of urban regions" (Madanipour 2006: 180). Today, public planning control has neither the financial power to shape our cities future nor the right instruments to steer private investments in their favour. Thus, planning shifted from a state-driven activity against private interest toward a competition for private investments. Madanipour (Madanipour 2006) sees this shift reflected in „the rising significance of urban design" as a private-sector planning approach. Especially in the UK, urban design has risen from a niche into the centre of the urban debate. Indeed, major structural changes in employment reflect the importance of private companies for our profession. Today, less than half of all planning graduates work in public administration (Böckenbrink, Greiwe and Weller 2013: 37). Independent planning education, which has always focussed on public planning control, becomes hereby less attractive for recruitment. These degrees usually equip graduates with state- or chamber-controlled diplomas. „The degree […] can be interpreted as one form of licensing" (Klein 2011: 256) to enter public service. The diploma ensures that the planning graduates handle statutory

planning instruments within the institutional and legal framework of our state. While the professional bodies still maintain their control over accessing formal planning service, an increasing number of jobs and planning degrees do not require or provide formal qualification. Innovative planning concepts are not the result of ‚cloning' of standardised planner.

Instead, „all employees must add value to the financial bottom line" (Brown, Hesketh and Williams 2002: 14). That requires leading and preparing students earlier and better towards top-level research and highly specialised practice. Universities implemented this target in form of a diversification of degrees on the postgraduate level. In the planning community, it has led to a renaissance of the engineer- and the social-science-planner. Engineering and social science departments have gained the opportunity to offer a wider range of specialisations at the postgraduate level. A single institute is able to conduct a small master's degree to make a mark academically (Kunzmann 2008: 17). The diversification of planning education is therefore closely linked to our societal desire for knowledge. "We wish for an authorisation of political [planning] decisions based on scientific evidence" (Lieven and Maasen 2007). Nevertheless, we "dismiss any type of technocratic governance" (Lieven and Maasen 2007). Planning history has demonstrated that cities are complex, hardly comprehensible systems. So, "we abandon the [modernist] idea that scientific truth about the future exists" (Alaily-Mattar and Thierstein 2014).

1.3 Complexity of Planning

Rittel & Webber (1973) argue that planning problems are fundamentally different from problems in science and engineering. Engineers are confronted with 'tame' problems, which can be solved rationally by finding the optimal solution. Planners are however confronted with 'wicked' problems. "In a pluralistic society there is nothing like the undisputable public good; there is no objective definition of equity; policies that respond to social problems cannot be meaningfully correct or false […]. Even worse, there are no 'solutions' in the sense of definitive and objective answers" (Rittel and Webber 1973: 155). 'Wicked' problems demand thinking differently about planning. Every planning problem is a unique 'one-shot operation'. There is no testing ground for social experiments. That means that the process of approaching a problem and resolving it has to be concurrent. Planning and designing to accommodate urban challenges is an iterative process with no 'stopping rule'. As we resolve one problem, we discover or even produce other problems. What we also produce at the same time, is a better situated understanding of a single planning problem. Thus, knowledge about 'wicked problems' is "localised, embedded and invested in practice" (Weber and Khademian 2008).

Knowledge can therefore not claim to be universally valid. Validity can only be constructed in a specific spatial and temporal context. We call these constructs of knowledge. Constructs of knowledge consist of the concept, idea or technique itself and of an observed impact. When looking at one construct a time, each of them is valid in itself. When comparing multiple constructs, they might actually contradict themselves. Especially the flow of planning knowledge across borders to developing countries such as China and its application in situ demonstrate that concepts and ideas cannot simply "be extracted from its context of invention, uprooted and 'planted' somewhere else" (Healey 2012: 190). For example, after Frank Gehry finished his work on the Guggenheim museum in Bilbao, planners observed a general economic and urban improvement of the area (Plaza, Tironi and Haarich 2009). The idea of the so-called Bilbao effect has travelled all around the world. Many cities hired star-architects to create their own 'Guggenheim'. However, the economic impact failed to appear (Scherer, Strauf and Bieger 2002; Jasmand and Maennig 2008). As said before, while one concept has a certain impact in one context, it might have a contrary impact in another (Girgert 2011). Nevertheless, these constructs exist and form the base of knowledge for planning academia and practice. This base of knowledge constructs is socially connected. People create knowledge, they share

knowledge, they adopt knowledge and they transform knowledge. Processing knowledge is the interplay of tacit and explicit knowledge (Nonaka, Toyama and Konno 2000: 12; Bentlage, Lüthi and Thierstein 2013: 48). Physical or ideological proximity are required for either sharing tacit experiences or combining codified constructs of knowledge. These process are responsible for the flow of ideas across borders. The constant creation and adaptation of constructs makes knowledge a dynamic network. Knowledge appears, it disappears and it transforms as part of resolving 'wicked' problems. The concept itself might take shape of something universal, its impact is however defined by the contingent of its context.

In summary, we have shown that planning education diversifies due to structural changes in employment as well as the nature of knowledge in planning. We argued that formal qualification can no longer guide educators in design planning degree programmes. In order to evaluate planning education, we will propose a system model looking at academia and practice.

2. Competencies revisited

2.1 Systemic View

In order to give structure to the diversified field of planning studies, we propose a systemic view (cf. figure 3) on the purpose and impact of planning education. The system model bases upon a linear input-activity-output-outcome-impact-schematic and two feedback loops. The underlying assumption is that educators intend to improve planning practice by ‚improved‘ education. Hereby, schools struggle with the discrepancy between established planning practice and state-of-the-art planning research. They have to balance between keeping students employable today and developing innovators for tomorrow. Time- and complexity-constraints furthermore hinder fulfilling both objectives, as programmes need to be feasible to study.
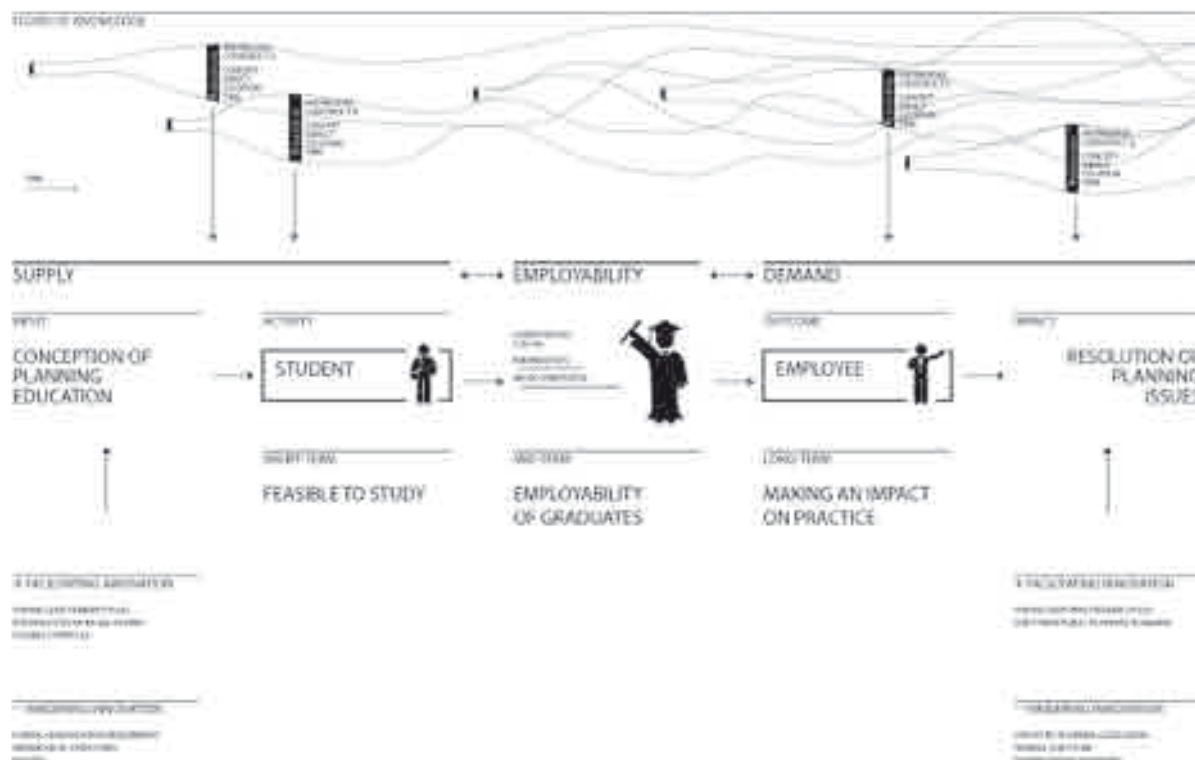

Figure 3: Systemic View on Planning Education. Author's Graphic

The left side of the model comprises academia, while the right side represents practice. The major tie between both parts is the central impact axis starting with designing and offering a planning curriculum (input), then putting graduates on the job market (output) and finally changing planning practice (impact). You might also look at this model in form of an supply and demand diagram, in which schools supply employers with graduates and vice versa. Employability measures hereby define the quality and value of graduates.

The first feedback loop is closely linked to the concept of employability, which we will elaborate on in section 2.2. We assume that programmes, whose graduate do not meet the job market's demand, have to change. Employers with unfulfilled demands will reorientate themselves and look for graduates from other fields - currently seen as part of the diversification of degrees. The second feedback loop is much more indirect. Because the underlying assumption of our model is the intention to change practice, education needs to be redesigned as soon as the intended impact on planning practice is achieved. This feedback loop relates to relevant issues in planning and the knowledge about them. As argued in section 1.3, constructs of knowledge gain and loose in importance over time. For example, the separation of land-uses has been a key strategy of modernist city planning for decades, which then got replaced by concepts of mixed use.

Both feedback loops have in common that they don't take effect immediately. Especially, the second feedback mechanism features a significant time lag. From the conception of a curriculum until graduation the first two to four years pass. Additionally, we need to add years until the graduate is in a position to actively change standard procedures and established concept. In a traditional work environment, we estimate that educators cannot expect an impact earlier than fifteen to twenty years after designing the course. Hierarchical structures in public administration slow down the way up the job ladder. The impact of education takes significantly longer than the rapid urbanisation process, today (cf. figure 4, Alaily-Mattar, Thierstein and Förster 2012). However, the shift of power and associated structural changes in employment have „given the educated classes greater economic freedom. This has enabled young knowledge workers to short-circuit organisational hierarchies to arrive in senior managerial positions often in their thirties" (Brown, Hesketh and Williams 2002: 5).
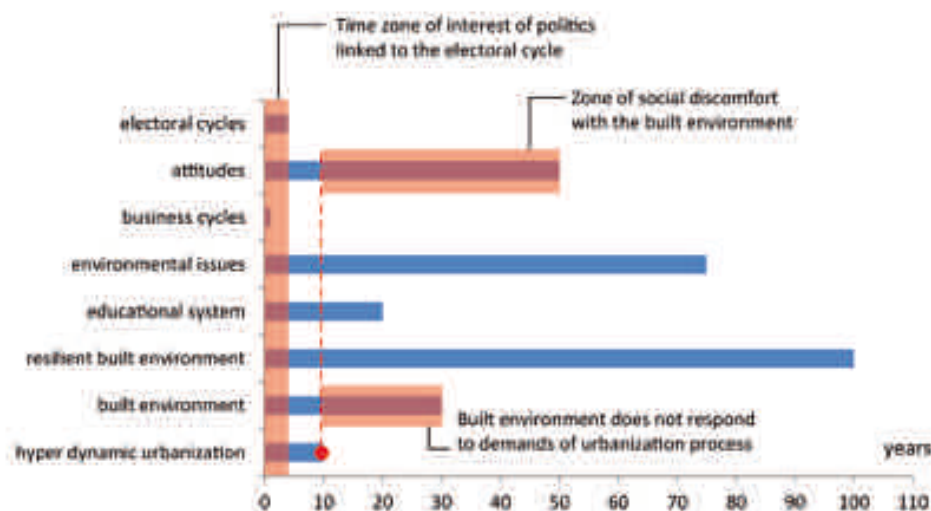

Figure 4. Time Lag of Various Systems. Source: Alaily-Mattar, Thierstein and Förster 2012

2.2 Competencies as Measures of Employability

„Employability is […] seen to reflect the shift away from the bureaucratic career structures" (Brown, Hesketh and Williams 2002: 4). Human resource departments examine „the personality package that candidates present to employers for evidence of competencies" (Brown, Hesketh and Williams 2002: 28) Personal attributes replace job-specific requirements. Applicants must present themselves as competent (absolute employability) and more competent than others (relative employability). Brown et al (2002: 9) call this the ‚duality of employability'.

The concept of employability bases upon personal attributes. These attributes are often described as competencies. Despite its common use, there is no clear-cut definition. The term's interpretation reaches from „the ability to handle a situation" (Keen 1992, 112, in: Stoof et al. 2002: 347) to „cluster of related knowledge, skills and attitudes" (Parry 1996, 50, in: Stoof et al. 2002: 347). Thus, the paper draws upon a constructivist framework for „understanding and using the concept of competence" (Stoof et al. 2002: 345). The idea behind this framework is, that the term competency is used differently depending on purpose and context. The term's definition is valid as long it is „adequate for the situation in which it is being used" (Stoof et al. 2002: 351). Therefore, the following definition is based upon Bloom's (Bloom et al. 1956) ‚taxonomy of educational objectives', policies developed by the European Higher Education Area (EHEA) and standards established by national practice. The definition will describe the internal dimensions of competency and the difference to other related terms.

Competence-based learning and assessment became policy in the EU as part of the Bologna process (Ministry of Science 2005: 63). The Bologna process is Europe's joint effort in implementing a single educational market based upon international transparency, recognition and mobility (Ministry of Science 2005: 57). Therefore, EU member states have agreed on common descriptors of learning outcomes. The ‚Dublin-Descriptors' use the word competence „in its broadest sense" (Flood Strom et al. 2004) leaving again room for interpretation and different national implementations.

Most countries however base their usage of the term upon Bloom's revised taxonomy (Anderson et al. 2001) differentiating between factual and conceptual knowledge (often referred to as knowledge or savior), procedural knowledge (often referred to as skill or savior-faire) and metacognitive knowledge (often referred to as attitude or savior-être) (Bulgarelli, Lettmayr and Menéndez-Valdés 2009: 37). The first dimension consists of knowledge about terminology, classifications and generalisations, principles, theories, models and structures (Anderson et al. 2001: 46). Procedural knowledge includes subject-specific skills, techniques and methods as well as „criteria for determining when to use appropriate procedures" (Anderson et al. 2001: 46) and metacognitive knowledge describes rather abstract concepts such as „awareness, self-awareness, self-reflection, and self-regulation" (Anderson et al. 2001: 55). Students can acquire different levels competence by ‚remembering', ‚understanding', ‚applying', ‚analyzing', ‚evaluating' or ‚creating' knowledge. Anderson (2001: 67) calls these the cognitive process dimension of competency. In summary, a competency consists of a construct of knowledge and the level of proficiency.

In practice, assessment and learning outcome descriptions always follow the same structure. The following examples are taken from module description of urbanism programmes in Germany. **Bold** phrases describe the construct of knowledge and <u>underlined</u> phrases the level of proficiency.

„After successful completion of the course the students […]
<u>know [better: recognizing]</u> different **dimensions of inspecting the city**: Forms of perceiving and appropriating the city (sensually, abstractly, structurally), morphology of the city,

are able to <u>develop</u> **a criteria check list for the city analysis** in view of the „city as a complex formation", the city as action field" and the „city inside one's head", methodological discussion, know how to <u>analyse</u> the selected **forms of the city** according to plan material characterised by the relation of city and house, city and space, city and city (urbanity), city and infrastructure, know how to <u>analyse</u> **the reality of the selected city area** <u>by means of images, behaviour description, script, movie etc.</u>,
are able to work with theoretical urban reflections: basics of <u>analysing</u> **statements on the city** (texts, conversations, interviews etc.), perceive and <u>critically assess</u> the content,
are able to **characterize** different **forms of the city** […],
are able to <u>transfer</u> **attitudes on the city to other contexts**" (Module descriptions appendant to: BTU FPSO Urban Design 2013).

„Examination consists of a 2-hour written exam as part of which the students have to demonstrate that they <u>remember and understand</u> **theories, mechanisms and impacts of the economic development of space and property** and that they are able to <u>transfer</u> **these** to a given problem. By transferring the theories the students show their ability to <u>understand</u> **popular forms of visualization and description of economic drivers of spatial change** in a specific case and to <u>evaluate</u> resulting **challenges for the urban development**" (Module descriptions appendant to: TUM FPSO Urbanistik 2015).

Both examples demonstrate that the level of specificity of each competence can differ. Some competencies apply to managerial, scientific or design work in general, some are specific to a profession or a professional sub-domain and others are only relevant to specific tasks. Best practice guidelines recommend, „learning outcome statements should be neither to broad nor too narrow" (TUM 2014: 7). Hence, most descriptions refer to the over-arching course content without specifying individual terminology, concepts and techniques, which can be learned in the course.

2.3 Competencies as Guidelines for Course Content Selection

The concepts of employability and competency are closely linked to a systemic view, which incorporates the employment sector as component of the educational system (Tchibozo 2010). Therefore, competence-based learning shifted the focus from learning content to learning outcomes (Bulgarelli, Lettmayr and Menéndez-Valdés 2009). This shift has been repeatedly critisised. Detractors of the competency term argue, „curriculum theory lost its primary goal - [to define] what is taught and learned in school" (Young 2013: 105). Willbergh (2015: 339) argues, that it is a normative question of selection, to which the concept of competence has added no value. Contrary to this opinion, we argue that focussing on learning outcomes as part of a systemic perspective enables curriculum design to select content based on employment needs and challenges in practice rather than normative concepts. The term competency stands at the interface between education and employment. Both sides of this system - the hiring human resource departments and the educating schools and universities - adopted the concept of competencies in order to bridge the gap between academia and practice. In summary, competence-based education does not neglect knowledge; it selects knowledge based on challenges in practice.

Although new career pathways have made the impact of education on the job market more immediate, the significant time lag still questions the relevance of taught knowledge constructs in the future. Detractors of the competency term again argue, „the problem of competency is that it assumes that what we judge to be criteria for success today will be stable and valid in the future" (Willbergh 2015: 338). Therefore, judgement on „competences requires the perspective of time" (Westera 2001: 83). Our system model reflects this perspective by conceptualising planning knowledge and issues as flows (cf. section 1.3). We argued that knowledge in planning can only be valid if deconstructed in its

unique context. The aforementioned time lack could therefore make acquired knowledge obsolete. However, we also argued that knowledge in planning is socially connected. Emerging new ideas base upon earlier and related concepts. Successful plans are often modifications of older planning proposals. Competent use of knowledge requires not only remembering, understanding and applying knowledge but also analysing, evaluating and creating knowledge. The employment market reflects this idea as part of the emerging knowledge economy, which is about the „exploitation of new knowledge in order to create more new knowledge" (Cooke 2002: 4-5). Although the relevance of certain constructs of knowledge may decrease, its importance as a basis for innovation and advancement is invaluable. Hereby, a competence-based selection process of learning content differentiates itself largely from one based on knowledge only. Knowledge remains one of the key input factors within the innovation process in spatial development (Bentlage 2014: 25), but the cognitive use adds an additional dimension overcoming the validity problems of knowledge in the future.

 In organisational research, there is a general consensus that new knowledge is created by the combination of old knowledge (Schumpeter 1934; Nonaka, Toyama and Konno 2000; Wenger 2000). Our proposed conceptional system of education is therefore a learning system of innovation. The model consists of two cycles of innovation: a lead-thinker- and a lead-practitioner-cycle. The separation of innovation into two cycles takes into account, that while the underlying idea of our educational model is bringing innovation from academia into practice, our graduates innovate new planning concepts and ideas in practice as well. Von Hippel's lead-user approach strongly reflects this idea in management theory (Churchill, von Hippel and Sonnack 2009). The concept of competency picks up this idea in form that graduates obtain the ability to transform knowledge according to new challenges. A competence-based educational approach is hereby preparing graduates for innovation.

Consequently, educators have to select knowledge based on its potential for creating new knowledge in the future. This so-called ‚powerful' knowledge in planning consist of those constructs, whose intended impact is achieved in more places over a longer a period of time. In other words, powerful constructs are conceptual and procedural knowledge, which is successfully employed by planners in the past, today and most likely in the future. Young (2013: 107) argues that such knowledge is highly ‚specialised' disciplinary knowledge. The underlying assumption is that „there is ‚better' knowledge, more reliable knowledge, knowledge nearer to truth about the world we live in and to what it is to be human" (Young 2013: 107). It is basically knowledge, which is based on stronger evidence and obtained a higher degree of consensus. You can usually find this kind of knowledge within the boundaries of academic communities, because members share "communal resources - [such as] language, routines, sensibilities, artefacts, tools, stories, styles, etc" (Wenger 2000: 229). Academics create evidence „on methodological grounds" (Faludi and Waterhout 2006: 9), e.g. by conducting systematic studies. Scientific standards such as accountability, falsifiability, or testability lend knowledge evidence (Davoudi 2006: 17). In other words, knowledge seems to be evident as long as the scholar's reasoning is reproducible and convincing, e.g. by empirical work. Hence, an important part of the education of planners is imparting specialised disciplinary knowledge for the „development of the evidence base" (UK Planning Policy Statement 12, in: Davoudi 2006: 17).

Planning practice is however „heavily influenced by events of the day" (Faludi and Waterhout 2006: 11). Situations are always unique with challenges occurring in different configurations. Planning requires improvising and innovating to a great extent. Hereby, planners can fall back on disciplinary knowledge, but they cannot resolve urban issues before combining different knowledge from multiple fields. The communities of practice literature calls this boundary work (Carlile 2002: 445). "At the boundaries, competence and experience tends to diverge: a boundary interaction is usually an experience of being exposed to a foreign competence. Such reconfiguration of the relation between

competence and experience are an important aspect of learning" (Wenger 2000: 233). Figure 2 showed three of those distinct disciplinary fields. The permeability for students switching between these fields is highly limited. Postgraduate independent planning degrees require undergraduate planning degrees. Postgraduate engineer-planner degrees demand a background in engineering. The continuing existence of all these fields demonstrate however the relevance for planning tasks. Hence, planners have to obtain the competency combining different disciplinary knowledge in order to resolve planning challenges.

3. Conclusions

In the beginning of this paper, we have outlined major challenges for planning education. We demanded structure for the diversifying urban discourse. Therefore, we presented a system model that describes the impact and purpose of planning education. The systemic view led us to conclude that we have to conceptualise planning as a boundary discipline - requiring disciplinary knowledge as well as the combination of knowledge across disciplinary boundaries. In contrast to other scholars, we do not propose a new general theory of planning (cf. Schönwandt 2008; Innes and Booher 2014). For us, planning is not a unitary discipline with a consistent set of concepts and procedures. Planning is rather the application of - often conflicting - scientific theories and ideas in order to resolve physical and social challenges in our cities. We reject the normative character of planning policy and embrace that the field of planning is complex. This complexity requires the joint effort of multiple disciplines and their different perspectives. No idea is superior over others. Knowledge derived from social sciences is equally important than knowledge from engineering. "In order to provide a sustainable response to […] challenges within society and urban space […] an approach involving all space-related disciplines is necessary" (Wolfrum and Schöbel-Rutschmann 2011). We therefore strongly agree with Howe (1980), when she argues that "the [planner's] choice of role should not be thought of as a choice between two conflicting ideologies of planning. Rather there are several dimensions of role which can be used separately or in combination".

„The emergence of transdiciplinarity […] signalled the need for new syntheses at a time of growing fragmentation of knowledge and cultures" (Thompson Klein 2014: 68). We call this boundary approach ‚urbanism' in order to differentiate it from planning. Independent planning degrees - with their expertise for public administration procedures (Hoch 2012: 130) - are only one community of practice within a transdisciplinary field of communities such as architects, landscapers, designer, engineers, geographers, sociologists and economists. The term urban-ism consists of two parts. The suffix ‚-ism' form abstract nouns of action, process or study (Oxford University 2015). The first part of the word hereby signifies the object of action - in our case described as ‚urban'. ‚Urbanism' therefore comprises all fields of action and study of cities such as urban planning, urban design, urban geography and so forth. Haas & Olsson (2014) recently asserted the term's emergence as part of the transdisciplinary debate about urban planning and design.

As a result, we question the central role of consecutive chamber-controlled bachelor-master-education in the field of planning. Today, professional bodies such as the German ‚Architektenkammer' or the British RTPI demand a minimum of four year consecutive ‚planning education' in order to work in the field of urban planning (Kunzmann 2008: 17). This hinders transdisciplinary work in practice, because companies and public planning departments are required to mainly hire graduates, who have acquired formal qualifications. As shown before, the development of livable cities does however require much wider knowledge, which students cannot obtain in established planning degrees. Hence, we propose educating ‚urbanists' at the postgraduate level. Here, education can base upon disciplinary fundaments. The goal of postgraduate education is then to further develop powerful key competencies

for the combination of disciplinary knowledge. This requires developing specific transdisciplinary didactics. We believe that this will be the major challenge for schools in the future.

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