Transition Skills

ABSTRACT: To contribute positively to systemic transitions within local communities, architects need to be critical, reflective, far-sighted communicators. This paper presents educational practices developing adaptive, systemic and co-creative approaches within the training of architectural Masters students. It evaluates the first outcomes of a four-year research through design studio, executed by the Academy of Architecture in Groningen, in which experiential learning helps development of heightened awareness, appropriate mindsets and critical thinking; enabling students to identify problems and challenges specific to their profession. Students, stakeholders, teachers and researchers involved in the studio form a learning community that critically monitors the educational program. By working on "live" projects, the studio produces insights concerning local scale energy transition in the North of The Netherlands.

Global issues urge fundamental changes in the Dutch energy system and recent accumulations of earthquakes resulting from natural gas exploitation in the region of Groningen make the 'energy transition' inevitable (Rotmans et al. 2001). Whilst alternatives, proposed by the Dutch government, mainly consist of isolated, mono-functional interventions (Boer and Zuidema, 2014), the studio investigates integrative systemic scenarios that seek to enhance resilience on a human scale by embedding the energy transition within local communities. However, systemic transitions may be unpredictable, as they tend to play out within complex spatial, social and economic arenas, involving multiple, multi-level stakeholders. Shove and Walker (2007) caution professionals, involved in long-term transitions, to remain critical during the "[continuous] cycle of problem-definition, intervention and response".

Ziegler and Bouma argue that analysing is designing in the reversed direction. The first year's outcomes consist of adaptive architectonic interventions within local communities, integrating flows of energy, food and waste. Using interviews with the learning community, the paper describes the educational processes leading to these outcomes, focusing on the formation and elaboration of the appropriate questions concerning stakeholders' interests; how these questions are kept central and deepened throughout projects; how they are represented at their closure and, above all, how they renew awareness concerning future regional needs. Initial findings stress the necessity of a circular research through design process, not necessarily to solve, but to accurately define those needs.

KEYWORDS: resilience; pedagogy; community of practice; research through design; experiential learning.

Introduction

Global issues urge fundamental changes in the Dutch energy system. Recent accumulations of earthquakes, resulting from natural gas exploitation in the region of Groningen places emphasis upon Rotmans' (2001) assertion that energy transition is inevitable. In order to investigate the contribution of architects to this process, the Academy of Architecture Groningen is executing a four-year research through design atelier (studio) for architectural Masters students. This is a collaboration between the Dutch research group Future Urban Regions and knowledge centre NoorderRuimte (Hanze University of Applied Sciences). It approaches regional energy transition as an opportunity to enhance local resilience. The studio is in continuous development; teachers, researchers, students and participating regional stakeholders form a community of practice, critically monitoring the educational program. This paper evaluates the first year's results.

Shove and Walker (2007) caution professionals involved in long-term transitions to remain critical during the "[continuous] cycle of problem-definition, intervention and response" (Shove and Walker, 2007). The education of architectural students does not yet adequately equip them to make positive contributions to systemic transitions and the spatial issues within these transitions are frequently complex and inconceivable; they occur simultaneously within different social-economic networks; they are identifiable through the interactions of diverse stakeholders, each with their own particular set of interests. The multi-disciplinary processes, through which the issues arise, are often protracted and complex by nature. The uncertainty concerning the problems and desired outcomes of such issues requires new methods of research and design. This paper focuses upon the following questions: What is the potential for energy transition to increase the adaptive capacity of local communities? Which skills does the architect need to enable local communities to increase their adaptive capacity and how can we educate architects to achieve the necessary professional profile?

Resilient Communities

Since the 1960's the energy system in the north of the Netherlands has been relatively stable because of locally extracted natural gas. However, there is growing realisation, locally, that adaptation to changes in the energy system will be necessary if social, economic and environmental futures are to be secured (Coyle 2011, Müller et al. 2011). In fact, the regional energy transition initiates developments within which people are increasingly leading the critical appraisal and formation of their own community's future. The new energy initiatives emerging from this process are not only focused upon the production of sustainable energy, they simultaneously attempt to have some, albeit minor, positive effect upon the balance of the globalised energy system. There is a quest "for alternatives

with more regional autonomy and possibilities for self-sufficiency" Schwencke, 2012:5). According to Coaffee (2010) involvement and empowerment of local communities is an important part of enhancing local adaptive capacity. Chandler (2014) states that developing a genuinely critical response to issues of power and governance has to begin by understanding how former assumptions about these issues are being challenged and transformed and by engaging with the emerging new common sense of resilience thinking.

Resilience conceptually describes the capacities of objects, organisms and individuals to engage in multiple, interwoven relationships. This paper makes use of this concept to describe a local community's adaptive capacity. DeLanda (2006) conceives a local community as an assemblage; a source of interactions between heterogeneous components. Instead of stressing the function of each individual component; a human being, an organism, or an object, within a greater whole, DeLanda emphasises a component's autonomy, as well as its capacities to interact. Capacities, he argues, are contingent and relational; they unfold within a specific time and place, in relation to other objects, organisms or individuals. Assemblages arise when these relationships form into recurrent patterns. In contrast to closed systems, assemblages are articulated by emerging possibilities and constraints. Assemblages are resilient because they can adjust to new circumstances by adopting unprecedented capacities.

The energy transition atelier carries out research through design to investigate the region's potential, the obstacles and the capacities of its local communities and inhabitants in general. Students, stakeholders, tutors and researchers work together to expose and visualise these characteristics. The new role and skills of the architect are central within this process of research through design.

Pedagogy

Boer and Zuidema (2013) demonstrate that a significant part of energy transition emerges from the potential of a place and its local community. Therefore, at least part of the knowledge concerning energy transition develops "from the bottom up". A "community of practice" seeking to expose and develop such potential concentrates a significant part of its research on local circumstances, knowledge and practices. Wenger, McDermott and Snijder (2002) define three integral factors that lie at the basis of a "community of practice". An urgent problem necessitates: the development of new domains of knowledge; the formation of an experimental, living community within which new knowledge domains can be researched; the development of new practices within which domains of knowledge would logically integrate. The activities within a community of practice are directed towards the directly interactive exchange of knowledge. The formation of a knowledge orientated

assemblage takes place through the repetition of interaction. DeLanda (2006) proposes that the development of an assemblage is accomplished in two dimensions. The first dimension lays down relationships between content; the integration of new experiences and insights towards a shared body of knowledge and expression; innovative practices are the expression of this integration. The second dimension covers the tension within territorialization; the articulation and demarcation of the knowledge domain and deterritorialization; the expansion or transformation of this domain by new influences and ideas. Wenger, McDermott and Snijder emphasise calm and liveliness within a community of practice. This is expressed in the varied rhythm of mutual interactions, the difference between public and small-scale meetings, at different levels of participation by those involved, in a changing dialogue between "inside and outside perspectives" (Wenger, McDermott and Snijder, 2002: 51).

A regional community of practice forms around the energy transition atelier, on one side closely connected to its geographical context, on the other, maintaining a critical relationship with this same context. Gruenewald (2003) appeals for a critical pedagogy of place; for a learning environment that "connects place with self and community" (Gruenewald 2003:7). The pedagogy within this kind of learning environment is experiential, multi-disciplinary and dares to question accepted practice. The aim of this is to not only teach students how to understand their own context, but also to give them a broad and critical instrument with which they can take ownership of this context and transform it. Ellison (2009) proposes that, in this situation, tutors must be aware of their own stance, background and implicit principles.

In order to evaluate the studio's educational processes and practical results, we will first clarify the research through design process in light of Kolb's experiential learning theory. Subsequently we will describe three key moments in the students' process of research through design, and analyse how the interactions of students and stakeholders contribute to the development of innovative insights concerning the region's resilience, and to the enhancement of the students' critical and inquiring capacities. Analysis is based upon observations, focus groups and interviews with students, teachers, researchers and stakeholders. Finally we will draw conclusions concerning our research questions.

Experiential Learning - Research through design

"Experiential learning is transformational, as concrete or abstract events are being transformed into knowledge" (Kremer, 2001: 226). Experiential learning theory, developed by Kolb, offers a framework for an experience orientated learning process. This framework consists of four stages; concrete experience; reflective observation; abstract conceptualisation; and active experimentation (Kolb, 1984: 30). The theory proposes that

these four stages must cyclically follow each other (Kolb and Kolb, 2005: 1). According to Kolb, a student learns by alternating doing and looking, feeling and thinking. Senbel (2012) emphasises that design education is characterised by integrated learning moments. Carmel-Gilfillen proposes that Kolb's four stages of learning must be continuously brought together, one after the other, within an integrated design education (Carmel-Gilfillen 2012: 62). She proposes that particular attention should be paid to the development of analytical skills within architectural education. Furthermore, instead of separate development, these skills require integration within "creative, practical and theoretical" learning activities (Carmel-Gilfillen 2012: 62). The atelier aims to provide an experiential learning environment, within which the students not only gain concrete experience but are also offered the calm and opportunity to take ownership of these experiences and to make them part of their mindset. Experiences place issues within the "real-world" and make them concrete. The students absorb knowledge and theory, they train their analytical skills and use design to experiment and further conceptualise. They work on issues from different angles and at different scales. They develop knowledge interactively with the community of practice. The atelier integrates Kolb's stages of learning within three educational phases:

1) Collective analysis and visualisation of the regional energy system and its potential for transition.
2) Collective energy scenarios for four separate locations representative of a cross-section through the urban, city-edge, village and rural areas surrounding the city of Groningen.
3) Individual, conceptual responses to location specific, spatial issues; strategic interventions designed to answer stakeholders' concerns and to resolve aesthetic or architectonic issues.

The phasing of the atelier enables us to touch upon a methodology that integrates design and research. This form of research, defined by Frayling (2003) as research through design is in development. It appeared during evaluation of the atelier that the process of research through design would have to be more clearly defined during all of the phases. In the first phase attention to the quantity and complexity of the questions and issues posed to the students is important. Closer attention to the guidance and application of scenario development methodologies as tools for analysis and design during the second phase is also required. During the third phase more time and attention is required for reflection upon and evaluation of the potential value of the design interventions for stakeholders and the region as a whole. Annual reflection upon the research questions will take place in the atelier and in the work of attached researchers. In this way, each year we aim to deepen, build upon and pass on our knowledge.

Analysis of Key Moments

Ziegler and Bouma (2010) argue that analysing is designing in reverse direction. Analysis of the research through design process within the atelier takes us back through its different phases and directs us towards the new knowledge and skills of the architect within energy transition. DeLanda proposes that "a new skill deterritorializes"; a new skill or new insight "increase(s) one's capacities to enter into novel assemblages" (DeLanda, 2006: 50). The analysis focuses upon three key moments occurring within three different project locations. They concern moments in the interaction between students and stakeholders that provided unexpected and transformative ideas; that raised questions amongst the students in respect of their own (project) process; and placed them in a position to learn to move within new assemblages.

'Testing Local Energy Potential' SuikerUnie, (phase 2 of atelier)

The Suiker Unie site is the derelict site of a primary sugar beet processing plant. Different extremes of focus were tested to explore its potential for local energy transition; local food production, organic water purification and the generation of renewable energy combined with green transportation solutions. The students developed a "portfolio of opportunities" orientated around the most fruitful combinations. The scenario methodology "allows us to imagine previously unknown solutions or developments" (Salewski 2011:16). It places stakeholders in a position to weigh and discuss possible futures (Salewski 2011:16). The question "what if" (this or that happened?) is central within this methodology. The municipal supervisor of urban design, reflecting upon this design instrument, wrote; [I]t teaches us that it is interesting to consider new ways of ordering (development) *(interview 10.4.2015.)*

'Reconnect flows of energy, waist and water' Lage Land, (phase 2 of atelier)

In search of a challenge and opportunities in the "Lage Land", a rural location, one of the students had a conversation with a local farmer. A synthesis within the research through design process began from the moment that the farmer pointed out to the student the nearby waste and water purification plant.

Analysis reveals the connection between potential energy savings in the processing of waste and purification of water. A closed cycle approach results in proposals for the redevelopment of the nearby sewage treatment installation to transform it into a plant for the manufacturing of resources; also including production of green gas, food products (protein for cattle feed) and an attractive local educational and recreational facilities.
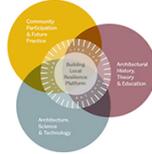
It is apparent upon reflection how strongly the combination of analytical skills with "creative, practical and theoretical" learning activities (Carmel-Gilfillen 2012: 62) can lead to new insights. Material flow analysis and the systems approach helped to develop new skills that connected with new knowledge. A director from the organisation owning the sewerage installation and involved as a stakeholder emphasised the importance of the role of the architect: "It is good to think systemically. In this way, architects can play with form to create positive awareness, amongst individuals and communities, for the waste materials and foul water (that they generate) and in that way reduce their own costs" (interview with a director from Waterschap Noorderzijlvest, 01.05.2015.).

'Intervene in daily Routines' Zuidhorn, (phase 1 of atelier)

Shove and Walker (2007) caution that the often implicit visions of the future, that often form the basis of transition policy, seldom emerge from "ways of living or patterns of demand"(Shove and Walker, 2007:7). The students were invited during to a meeting at the Zuidhorn municipal offices in the centre of the commuter town of the same name. The event had been organised by local authority officers to allow them to make acquaintance with the issues and obstacles connected to the municipality's sustainability policy (or vision). The students, who had until that moment concentrated, within the confines of the academy, upon the abstract scale of regional energy transition, had expected to finally make contact with local community stakeholders involved with real energy initiatives. There were, to their disappointment, no such stakeholders present. Unease was further created when it appeared that no such initiatives existed within the immediate area. The students put critical questions to the civil servants and councillor who were present concerning the realism of the municipality's ambitions if they did not meet the needs of local residents. At the same time, the students also realised that they would have to reassess their own abstract concepts concerning energy transition and seek to address the issues of significance, with creativity, that intervened within the daily lives (needs, routines and practices) of local inhabitants.

"It is a matter of finding new methods for directing (development) with the new issues such as energy transition" (interview with the municipal supervisor of urban design 10.4.2015.)

The architect's traditional domain is being deterritorialized under the influence of new challenges. Because of their unknown nature, perhaps inherent to all new challenges such as energy transition, design seemingly covers an apparently limitless space of possibilities within their context. DeLanda, building upon Deleuze, understands a space of possibilities as a virtual force field. The apparently limitlessness of possibilities in this force field are

structured by tendencies or mechanisms. These mechanisms provide each separate design trajectory with direction. It is the search for new spatial mechanisms that will define the architect's future domain. Each year the atelier tests these mechanisms to increase understanding in the new role and skills of the architect. On the basis of our analysis, we provisionally differentiate the following guiding mechanisms that direct the issues connected with energy transition:

1) the needs, routine and practices within communities
1) cycles and flows of energy, waste, water, food and mobility
2) energy potentials

We derive from these mechanisms that the architect's new skills consist of learning to distinguish between the different needs and ambitions within local communities; critically and sensitively intervening within existing routines and practices; innovatively connecting and manipulating cycles and flows; testing energy potentials.

Discussion

In evaluating the first energy transition atelier we have focused upon two research questions: What is the potential for energy transition to increase the adaptive capacity of local communities? Which skills does the architect need to enable local communities to increase their adaptive capacity and how can we educate architects to achieve the necessary professional profile? Based upon the process and upon the first results we conclude that the process of trying, within a spatial context, to save energy, as the first step of energy transition lead some students to a connection with the parallel need to close the cycle of material and resource flows within local communities. New relationships between these flows and everyday human practices contribute potential increases within the adaptive capacity of local communities.

Upon the basis of our analysis, we differentiate the three guiding mechanisms that direct the issues connected with energy transition. From this we derive a number of skills required by an architect if he or she is to contribute positively to transitions within local communities. A number of these skills can only be developed with the interaction of stakeholders, in a (self)critical, investigative and experiential learning environment.

The scenario design instrument finds a more central and key role in the research through design process of the second energy transition atelier. The usefulness of this instrument has put us on the trail of a fourth guiding mechanism, namely the paradigms that underpin the formulation of new special issues. We shall study this mechanism in our evaluation of the second atelier.

Community
Participation
& Future
Practice

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