

Reflections – Thesis: Creative Roads Towards Urban Nature-based Solutions

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1. Explanation of Preliminary Graduation Phase Results

The preliminary results uncovered a novel concise framework that translates the ways of thinking towards ways of saying and doing to integrate creativity in the whole NbS implementation process to integrate NbS in the urban development projects. This framework connects the various stages of this development process with the several reasons for integrating creativity showing why and how creativity should be included in these parts of the process. This framework is a new way of presenting already existing knowledge, however, could have been better developed for P5. This is partially done; however, it has been noticed that research is never done, and models can always become better trying to make sense of reality.

To come to this product a very chaotic process was executed, where iteration was one of the most used techniques. This led towards novel ideas, however also led towards many sidetracks. Less emphasis was put on the elaboration and deepening of the findings. Reflecting on my strengths and weaknesses, I know that iteration comes naturally, and elaboration sometimes doesn't. This is something that could have been better arranged by planning weeks that are more about iteration and weeks that are more about elaboration. For the P5 I can put more emphasis on the elaboration to really make this thesis a strong constructive evidence-based work. This has been tried out, however remains a struggle and can become a learning point for the future.

2. Method Choice, Rationale, and Effectiveness Assessment

For this research, I was interested in the individual person: their ways of thinking, saying, and doing during the development process and how these are connected to one another. It took me a very long time to actively isolate this focus from all the other curiosities I had about the context, and I would say I still struggle with that. I think this ultimately led me to conduct only interviews and analyze mostly commercialized documents as methods, primarily grasping the context during the process.

Looking back, I doubt whether this was the best choice of method. While interviews can provide insights into people's ways of thinking, saying, and doing, I only captured their own perception of this at a single point in time. Furthermore, I only managed to grasp a small piece of it during the interviews because my curiosities about their context led me to explore that instead. At the same time, I sometimes used the wrong probes, asked the wrong questions, and didn't expose their ways of thinking, saying, and doing enough resulting in storylines that were scattered. I do believe that the story lines could have shown the whole line along thinking, saying and doing.

Moreover, observations, including pre-briefing and debriefing, could have been a valuable addition to more directly (including my own perception) capture their ways of thinking, saying, and doing at different moments in the development process. This might have gained more structure and avoided deviating too much into their context or asking ineffective questions. Although I considered this approach before finalizing my choice of method, it became too complicated to execute given the limited

timeframe, the need for more deeply involved participants, and the messiness of my thoughts (as described before), which lacked a clear focus and concrete action plan by the time participants needed to be involved.

3. Mentor Feedback Reflection

Both of my mentors consistently challenged me with new ways of thinking about my research. This pushed me to let go of overly criticizing existing doubts and instead become more critical of aspects I hadn't previously considered. Their input kept my perspective fresh throughout the process, helping to limit researcher bias.

However, some feedback kept recurring, such as: "You are very reflective, iterative and have a lot of curiosity, which is both a strength and a weakness," (which I already discussed), "You are very pro on NbS and the need for creativity." From the first time I heard this feedback, I challenged myself to be more objective towards these subjects and I believe my thinking about these topics has become more contemplative. However, I haven't found a way yet to translate this thinking into saying and doing. This is something I aimed to achieve for my P5 pushing myself to elaborate and argument, delivering proof of concept. In the end this has been partially done, however not in the same extent as the whole built-up of the research.

4. Integrating Feedback: Learning from My Research

The most important consideration for undertaking the research topics Nature and Creativity was my desire to learn more about these subjects within the context of urban development, to gain an understanding of the complexity of these topics, and to explore all the fun and interesting elements involved.

My own work enabled me to explore these aspects, and I also challenged myself to view them from different perspectives, striving for a holistic understanding of what is happening and finding the critical points of attention. This led me to new insights, not all of which were directly relevant to the organization of creativity, but they did spark new thoughts about what it means to develop with NbS.

Translating these insights to understand what kind of organization of creativity is needed was not easy, as I could frame many stories in different ways, because creativity itself can be described in many ways. Therefore, step-by-step, I tried to compress the entire research into something simple by making deliberate choices about what to tell and what not to.

This is also an interesting challenge when conducting research. As you start becoming an expert, every detail leads to five new questions, and you do not have time to answer all these questions. I learned to select those questions that needed to be answered to adequately address the research question.

5. Final Phase of the Graduation Period

The final phase of the graduation period was to allow me to strengthen my thesis, aiming to make it relevant, simple, fun, coherent, and hopefully inspiring. I focused on synchronizing all parts of the thesis to ensure that the literature research and empirical findings seamlessly connect, creating a coherent narrative.

Additionally, I planned to minimize the diversity of terms I used, employing specific notions only when necessary. Using too many complex words can lead to ambiguity, something I want to avoid.

Ambiguity often complicates understanding, a challenge I have met myself when reading academic papers. While multiple interpretations of a sentence can be beneficial, excessive ambiguity can obscure the overall story. This however is a very hard and long process which hasn't been finished for P5.

Lastly, I focused on presenting my story in an engaging way to my audience. This includes my supervisors, the exam committee executive, and individuals who may not be familiar with the topics and context I have researched.

6. Linking My Graduation Project to MBE and AUBS

My graduation project explores how project developers can organize creativity to develop nature-based solutions in an urban context. It mostly corresponds to the Design and Construction management department. The project developer plays an active role in managing both design and construction of the built environment where they are constantly trying to balance the quality, time and budget of the project (Iron Triangle). My study challenges this management model in a way that it is not only about balancing quality, time and budget, however also about finding symbioses between the tree by using creativity to find new combinations that can lead to more effective solutions.

NbS plays a significant role in this, as it can be considered a relatively new ingredient that can be implemented to generate these new combinations. The organization of this creativity with NbS as a new ingredient focuses on including this new ingredient as a full-fledged part and all its new management challenges it brings along that needs creativity to solve. These challenges for the project developer however goes beyond only Design and Construction management and also touches Urban development management including the larger scale to make ecological and water connections with the surroundings and a bit of Real estate management considering the user phase of the buildings where the NbS maintenance becomes a new design challenge that needs to be tackled by the project developer during the design and construction phase and needs iteration during the user phase.

My graduation project aligns with the AUBS program's goal to teach technical ability and motivate innovative methods in architecture, landscape architecture, urbanism, and building sciences and management. By focusing on organizing creativity to integrate nature-based solutions into urban settings, my work not only uses these interdisciplinary principles but also enriches the field by promoting sustainable practices that improve both environmental and urban quality. This mix of creativity and management for NbS is fundamental to underscoring the benefits of combining (landscape) architectural, urban, and scientific viewpoints in urban development.

7. Interaction Between Research and Recommendations

I started with thinking about recommendations from the start of the research in the form of hypothesis and tried to challenge and iterate these recommendations during every step of the process forming them into the recommendations that are positioned by literature, empirical findings and my own critical thinking. In this way I created recommendations that exposes a certain way of thinking, saying and doing that can challenge the project developer to take a step further into organizing creativity in their development projects in a way it positively impacts their quality, time and budget management.

8. Evaluating the Value of My Work Approach and Methods

I always trusted my iterative thinking, based on what I know so far, exploring new things by asking the right questions, just doing, using critical thinking and reflecting, assessing the value of my way of working. I gained this trust in iterative thinking during my education at the TU Delft, where I learned all those steps. For instance, in Research method courses, I learned how to construct an approach in a way the conclusions can be trusted and understood in the proper way by delivering the right context and using select the proper methods. Moreover, I have learned what it takes to do an interview in an ethically correct and neutral way. So, when performing the interviews, I constantly reflected on myself if I practice the things I have learned in theory. This always led me towards assessing the value of my way of working and led to new discoveries on how to improve my approaches, methods and methodologies.

9. Assessing My Graduation Project: Value, Scope, Implications, and Ethics

To assess the academic and societal value of my research, I identified and aimed to fill a gap found in the existing literature. This gap was defined through extensive literature research, finding what was missing and whether filling this gap would serve societal needs. Throughout my research, I iteratively refined this gap definition by incorporating new notions discovered during my study into further literature searches.

The scope and implications of my project are closely interconnected. I view the implications as direct responses to my research questions, and the scope as the necessary context to understand the added value of these implications. Throughout my project, I continuously evaluated whether new findings fit within the scope or the implications, adjusting the definitions and relevance of both, as necessary. This led to a constant refinement of the research questions and the conceptual framework.

Ethical considerations were assessed in my research through assessing against ethical criteria I have learned about in Research Methods. This formed the base for making an informed consent form. Moreover, I assessed ethical considerations through open communication with interviewees. I was transparent about the data I needed, what I intended to do with it, and any potential risks involved in their participation. I prepared a standardized informed consent form detailing these elements and obtained signed consent before collecting any data. I also ensured that any concerns they had were addressed before signing and sometimes invited them to make modified or other agreements if necessary. These modified or other agreements were made in conversations and confirmed via email. Any concerns raised by the interviewees also prompted adjustments to my research approach. In this way I did not only ensure my own assessment for ethical considerations, however also the assessment of others.

Lastly, I simultaneously assessed all the mentioned elements through informal conversations with fellow students, family, and friends, checking if my storyline made sense. I asked them critical questions about my own work to gain their judgments from multiple perspectives.

10. Assessing Transferability of Project Results

To assess the value of the transferability of my project results, I consider it crucial to address potential ambiguities in the project results. I ask, 'What ambiguities might a reader identify in these results?' and 'What clarifications are needed to resolve these ambiguities?' I clarify by continually refining the context and explanations of my project results to ensure that others can accurately understand and evaluate the applicability of my results to their specific situations and contexts. They can only then make an informed judgment about how and where the project results can be effectively transferred. The topic of the research however is very complex, making it hard to completely mitigate ambiguities.

11. My Additional Reflections

Reflection 1: How did my perception of the connection between creativity and NbS change?

The concepts were both discovered from a scientific perspective (literature research) and a practical perspective (empirical research), which led to insights. The interesting thing I saw in literature was that data about NbS and Creativity uses similar notions, however NbS literature rarely uses the notion of creativity. This led me towards the first hypothesis of an undiscovered connection or synergy between the two notions. I hypothesized that NbS probably would be a creative product, and that creativity is needed to make these NbS. This is in some ways true; however, I now see that the creative product for urban development has more components, including housing, streets, etc.

This means that NbS is not only part of a creative product; for example, a tree providing shade, but also a creative resource “a tree” that can be integrated into creative processes to give a unique value to this resource. This led me to view my research more as a way of exploring how NbS as a creative resource can be integrated in a fair way in the development process. This led me to the discovery that you do need to organize creativity in the whole lifecycle of the development and maintenance of NbS due to its unpredictable adaptive nature, which is different from other creative resources such as bricks.

Now I still wonder if this extensive organization of creativity through the whole lifecycle is only necessary now or will also be necessary in the future when NbS might be more standardized and the need for innovation disappears. However, the uniqueness of case and its contextual setting will never change, which means that the NbS will relate and react to this unique context in a unique adaptive way needing a unique solution making NbS a potential creative problem.

Reflection 2: Which of my discoveries were most surprising?

The first discovery that surprised me was about the overall positive ways people think about developing NbS, because they really value NbS in their built environments as a quality of life for humans. Therefore, this subject inherently receives more attention and enthusiasm from all different parties than other sustainability measures such as circularity. This almost naturally leads towards an intrinsically motivated project collective, because the ambitions for NbS really resonate with all members of the project collective, naturally generating the first of three components for creativity (intrinsic motivation).

The second discovery that surprised me was about the importance of understanding the criteria for the quality of NbS for it to be effective in strengthening biodiversity. When not sufficiently checked during the creative processes, the creative product might end up being not useful. Therefore, the knowledge component of creativity needs special attention. Understanding these criteria and gaining the proper knowledge will continue even during the operation phase of the project, when nature only starts to develop itself by responding (unpredictably) to its environment. Therefore, it is important to still be flexible as a project developer and organize creativity as a response (conducting).

The third discovery I made and surprised me was about the absurd problems that came along when it comes to nature-inclusive policy and how, funny enough, these problems in some creative ways again could be solved using NbS (See the frog incident in thesis document). As I mentioned before, NbS can be a creative product, however, it is also a creative resource and can create a new open-ended problem that needs new creative processes, especially when it is still relatively new in the context of today's urban development making it a dynamic creative practice to integrate NbS into urban development.