Aspects of design and knowledgebase thinking – Design goals framed by Procedural Theory

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The procedural theory or design process is a step-by-step procedure and exploratory method that takes a problem-solving approach to landscape design. According to Murphy (2016), a clearly defined design problem increases the likelihood of a successful resolution, where information intake and knowledgebase thinking during the design process is a critical part to achieve a successful design outcome (Bursic and Altman, 1997; Murphy, 2016). This factsheet shows some examples of the design process, and focuses mainly on reflecting on and describing useful methods for clarifying the design goals and design problems.

This factsheet is the product of the students' work with *Procedural Theory* in the course Urban Landscape Design during the spring term of 2024. The aim of the assignment is to reflect on and communicate urban landscape design working processes, by studies of procedural theory. The assignment deals with elements that, in different ways, affect the interaction between method development, analysis and conceptual statements, from sketching processes to the final design proposal.

The course *Urban Landscape Design* (LK0400) is an independent bachelor's level course focusing on design of urban green spaces, offered at the Swedish University of Agricultural Sciences, and run by the Department of Landscape Architecture, Planning and Management (LTV faculty). The course considers elements that, in various ways, affect the interaction between analysis and development of methods and concepts through studies of design theory, from sketching to the final design proposal. Landscape visualisation is an important theme throughout the course, and helps to increase the student's awareness of the interplay between contextual relations and concept development. The students are encouraged to apply experimental approaches, where analyses and evaluation are mixed with theoretical reasoning. The main aim of the course is to use different ways of working with design in the urban environment, and – supported by design theory and good examples – apply, document, and present design processes, both individually and in group work.

The following abstracts and poster presentations present the students' thoughts and reflections through visualisations and descriptive text, and show attempts to verbalise the design process steps/phases. The assumptions made and described in this factsheet are based on literature studies of procedural theory, as well as on the students' previous experiences of the design process, and through individual and group reflections and discussions.
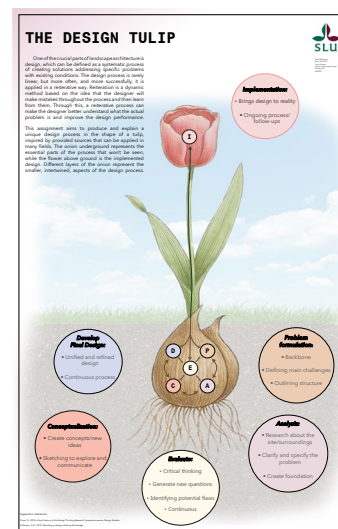
The design tulip
By *Ernö Tóth-Pál, Jurre Severs & Sara Wihlborg*

Landscape architecture is a multidisciplinary field that involves the planning, designing, and managing of outdoor spaces to achieve aesthetic, environmental, and functional values.

One of the crucial parts of landscape architecture is design, which can be defined as a systematic process of creating solutions addressing specific problems with existing conditions. The design process is rarely linear, but more often, and more successfully, it is applied in a reiterative way. Reiteration is a dynamic method based on the idea that the designer will make mistakes throughout the process and then learn from them. Through this, a reiterative process can make the designer better understand what the actual problem is and improve the design performance.

This assignment aims to produce and explain a unique design process in the shape of a tulip, inspired by provided sources that can be applied in many fields. The onion underground represents the essential parts of the process that won't be seen, while the flower above ground is the

implemented design. Different layers of the onion represent the smaller, intertwined, aspects of the design process.

Problem formulation

The first part of the design process is the problem formulation, which provides a backbone for the whole project by defining the main challenges and outlining the structure. Without a good formulation, the likelihood of success is reduced.

Analysis

The purpose of an analysis is to get to know the site and its surroundings. An analysis can be done by visiting the site, sketching, viewing and surveying maps, and making conclusions about the found results. This phase makes sure that there is a foundation for the design. The analysis can also make the problem clearer and help with specifying the problem definition.

Conceptualisation

To make a design that stands out combined with the characteristics of the site and its surroundings, there is a conceptualisation phase. The making of the concepts can be done via sketching. The purpose of sketching is to explore different perspectives and possibilities for the project. In addition, it is a good way of communicating with the design team and/or clients. Eventually, the sketching will lead to one final concept that will be refined for the design.

Develop the final design

The final design is developed by taking all the smaller pieces from the problem formulation, analysis and ideation, and forming them into a unified and refined design. In a reiterative process, this doesn't have to be a final destination before the implementation. Instead, the designer can work through the process a few times before deciding on an actual final design.

Implementation

The implementation phase of the design process brings the final design into reality. However, it's not a one-time activity but rather a process that unfolds over time. This phase - just like the other ones - creates feedback which should be dealt with. Continuous adjustments, refinements, and maintenance should be done after implementation for it to be sustainably successful.

Evaluation

Evaluation is an important phase of the design process since it can help the designer identify potential flaws in the design and at the same time generate new questions. It can also be an essential part of a reiterative design process since it helps the designer to reevaluate and learn from mistakes throughout the whole process and not just in the end. By doing so, the designer constantly works with their design critically, where the evaluation can lead the designer to jump between phases in a nonlinear way.

Supportive references: Cross (2018); Hoffmann (2019); Murphy (2016).

Catching the design process

By: *Linnea Licina Sjöholm, Tove Olsson & Vilma Gustafsson*

While describing the design process we made the connection to the spider's process of building its web. There are certain building elements needed to reach the finished product - but both may wander back and forth; leave and come back; as well as external factors may impact the work and result. Therefore both processes need to be flexible and dynamic.

We have named six steps of the process which we believe are important. Most often it may start with analysis, an idea or sketching - but not always. The spider's way through the web symbolizes that the designer's way through the design process isn't linear but often rather spiral. The six steps are as following:

Analysis

The design process begins with defining the design problem and gathering information about the requirements of the project. This is accomplished by investigating the surroundings, soil conditions, weather conditions, history of the place, and how the project can be developed in the future. The collected data are then examined and used to identify critical steps in the design.

Sketching

In all the steps of the design process, the designer is helped by sketching. Sketching can be used to visualize the collected data and ideas and be a helpful tool when communicating the concept.

Concept

A concept describes the premises, the process and the outcome of a design proposal - if implemented and succeeded. It's important to test a concept - against both the given context and to other concepts. Several concepts may be included in the net and get revisited during the process.

Design

At some stage it's time to concretize the design. A continuous process of assessments and reevaluation is key to promote and develop successful design solutions. Sometimes when making design decisions - strengths and weaknesses show.

Result

Eventually the designer must settle for a final design. Choosing the best concept can be done by comparing different ideas and solutions from previous steps of the process. Since landscapes change over time and we work with living material, it is important to remember that the design will continue to evolve.

Reflection

Reflection of a project is important for understanding the implications and functions of the design, while evaluation is important in order to improve the outcome of future projects. As a landscape architect you are often tasked with designing spaces meant to be shared between different types of people. Reflection of the social capacity of the designed landscape is therefore important for a successful outcome.

To summarize, structuring the design process is difficult, because there is a need for flexibility within the process. Having a structured plan can be helpful, but keeping an open mind is key to promote a creative process and to develop successful design ideas. We believe that the way to reach a good result catching the design process like the spider is building its web.

Supportive references: Herrington (2016); Hoffmann (2019); Milburne and Brown (2003); Murphy (2016); Lawson (2005).
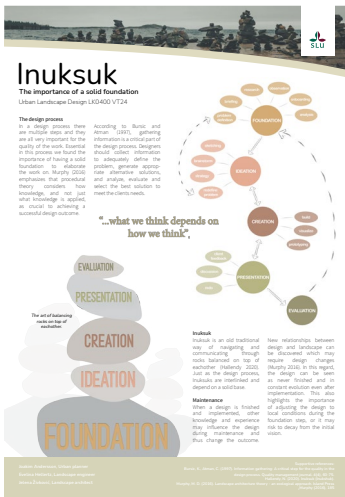
Inuksuk - The importance of a solid foundation

By *Joakim Andersson, Evelina Hellertz & Jelena Živković*

Procedural theory encompasses a set of tools to guide the design process of creating and organizing different elements to solve a problem or reach a specific vision. The steps of the process can vary between designers, but the concept is similar. In our group we found the steps being; foundation, ideation, creation, presentation and evaluation. It's important to remember that even if the steps are built on each other, they are also interlinked. That means going back to a previous step can be valuable for the process of moving forward.

All steps of a process are important for a successful end result, but what we found as an extra critical step is the foundation. Gathering information is fundamental for the design process as it provides that necessary foundation for understanding the users, defining problems, generating ideas and making informed decisions which can ultimately lead to creating successful designs. A broad foundation can generate a wide range of different outcomes connected to the same core.

According to Murphy, procedural theory in design focuses on the mechanics of the design process, asserting that application of knowledge is just as crucial as the knowledge itself. The evidence-based design process seeks to bridge knowledge with the actual design. In this approach, problems are examined in connection to what is known about design intentions and their contextual background. This involves a systematic process of research, reflection and decision management, constituting both a learning and thinking process. Our thoughts in design are significantly influenced by how we think, and the choice of thinking process plays a key role in shaping the design outcome, as indicated by Murphy.

Overall, Murphy points out the importance of the procedural aspects of design thinking and the relationship between the application of knowledge and the successful realization of design goals.

Our flowchart shows what we consider to be the necessary steps in a landscape design process. However, once a final design result has been achieved the process will, in a sense, still continue. Depending on who is responsible for maintenance, other knowledge and experience may influence the design and thus change the outcome. With new knowledge and information, new relationships between design and landscape can be discovered, which may require some design changes. In this regard, the design can be seen as never finished and in constant evolution even after implementation as maintenance is part of sustaining the design.

Inuksuk is a tradition originating from Canada and the north where rocks are balanced on each other. The landmarks are used as navigating aids and a way of communicating. All Inuksuks are unique and shaped after the conditions at site. We found the symbolism between an Inuksuk and the design process being intertwined. The components are all connected where balance to success is key as well as having a steady base. Like the Inuksuk, every design process is unique and takes different shapes depending on the type of designer and the project's starting position.

Supportive references: Bursic and Atman (1997); Hallendy, N. (2020); Murphy, M. D. (2016).

Design Puzzle

By: Elin Kindahl, Moa Linder & Li Nilsson

There is no correct method of designing, designers use their own way of working. However, there are some general approaches that can be used. Based on the literature, the group has developed its own approach to the design process, which includes 4 main steps. The design process presented here is based on inductive reasoning, which is an exploratory method (Murphy 2016). We interpret the design process as puzzle pieces that need to be put together to create a final design proposal.

Definition of the problem
The first step in the design process is to define a problem to be solved. In landscape architecture, this is usually a site-specific problem. The definition of the problem is essentially the answer to three questions: *"What do we have? What do we want? and How do we get it?"* (Murphy 2016). Through the questions, it is possible to determine the most critical conditions and challenges, which also provides a framework for developing the concept.

Research
After identifying the problem, research about the place is the next step. Wallas (1926) is writing that his first step in a project is to find and process relevant information about the problem and let the mind focus on the most important parts. Site analysis is a tool that we use a lot in our design processes to understand the place and the surroundings. Sounds, traffic, mowing patterns and vegetation are some examples that can be studied. It is not unusual to have to visit the place many times since it is, for example, relevant to observe the place at different times of the day.

Concept
The development of a concept can be done by brainstorming based on the "Definition of the problem" and the "Research", creating a common thread throughout the work. Lawson (2005) writes that one approach can be "Telling a story" because it links together the most important features of the design. Architects often work with characters and their "roles" of using the site and to empathize with different contexts. Another approach could be by using a theme, for example that the site shall be "colorful" or having a feeling of "forest".

Design
The last part in the process is to start designing the place and create the final visual design that shows the new environment. Sketching is a useful tool and Hoffman (2019) writes that sketching is a form of thinking, you think in

a visual way on paper. Murphy (2016) means that it is important to communicate visually when you are going to show others what you have designed. Illustration plans, sections and perspectives are some visual imagery that we use a lot.

Supportive references: Hoffmann (2019); Lawson (2005); Murphy (2016); Wallas (1926).

Conclusion

In the line of work by landscape professionals the procedural theories has to do with the essence of phenomena dealt with during the design process. The transformation during the various phases may move from a broad context to detailed information or taking the opposite direction. According to Murphy (2016), a clearly defined design problem increases the possibility of their successful resolution. Murphy (2016) points out that a clearly defined design process enhances the likelihood of a successful resolution, with the sketch process serving to catalyse the creative progression (Hoffman 2029). It becomes evident, to varying degrees, that the process, despite occasional depiction as a stepwise development, cannot be restricted to a linear working model. Instead, it possesses the characteristics of a tentative and iterative process, where the design work fluidly oscillates between different stages and facets of the process.

All the students' suggestions regarding the design flow underline to some extent the sketch as a crucial tool in the search for design solutions. The role and importance of sketching as an investigative and communicative tool permeates the students' attempts to describe selected aspects of the design process. In this context, the design process facilitates testing, evaluation and clarification of the creative development (Hoffman 2019).

The abstracts and posters presented in this factsheet emphasise the importance of each phase in the design process, and discuss various ways of identifying the design problems and their connection with the design goals. As teachers on the course and practising landscape architects, we would also like to take the opportunity to thank the students for interesting and fruitful discussions about identifying design problems and their connection

with accomplishing design goals. From the perspective of group activity and the task of working with a personalised process, the students have performed well and been successful in demonstrating the ability to extract the principal ideas of Procedural Theory. Our expectation is that the theories and a critical examination through reflections and discussions in the groups have given all the participants buoyancy in their own assumptions or new signposts in the search for their own personal method

Further information about the course Urban Landscape Design, see https://www.slu.se/en/education/programmes-courses/course/LK0400/30239.2122/Urban-Landscape-Design/

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