Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

Personal information	
Name	Jaap Koopmans
Student number	4555953

Studio		
Name / Theme	Architectural Engineering – Second Life	
Main mentor	Anne Snijders	Architecture
Second mentor	Paddy Tomesen	Building Technology
Argumentation of choice of the studio	- Fascinations for technical realization of architectural challenges - Interest in material study with connection to the healing environment - Connecting the technical aspects of a building with its architectural experience - Tackling on challenges	

Graduation project	
Title of the graduation project	Empowering the Healing Environment – A Holistic Approach
Goal	
Location:	Stationsplein 107 - Leiden
The posed problem,	
research questions and	
design assignment in which these result.	

Problem statement:
According to the Rijksinstituut voor Volksgezondheid en Milieu (RIVM), there will be more focus on tackling the unhealthy effects of urbanization in the near future. This together with the presence of a large stock of vacant buildings and other developments within these urban areas and the challenges which are formed by the developments in healthcare brings up the potential to create so-called healing environments.
Although, mostly situated within a natural context, the question could be how to implement the design approach of a healing environment into an existing building within an urban context and what values it could bring to the surrounding neighborhood. Especially when given an user-centered (holistic) approach.

Main design assignment:
In what way can the healing environment as an user-centered design approach of a rehabilitation clinic within an urban context be of value for the (medical) wellbeing of the users and its surrounding context?

Sub-question 1: Which already known architectural design aspects from the healing environment are there to benefit the medical wellbeing of humans and how are they implemented into the realized design of existing projects?

Sub-question 2: In what way can the materiality of the researched architectural design elements empower the efficiency of the healing environment?

Sub-question 3: Which technical challenges are connected to the integration of this design approach within an existing building as part of reusing vacant post 65 buildings within the inner urban context?

Process

Method description

For **sub-question 1**, case studies will be performed on existing projects - which use the term 'healing environment' as a guiding theme - by analyzing in what way they implemented the design approach of the healing environment. This design approach is defined by looking at different literature about the healing environment as a form of architectural designing.

Sub-question 2 will be answered by performing a material study onto what different projects, based on a spectrum of sterile materialization to biophilic materialization, use as main materials within their design. This is followed by creating three iterations of virtual mock-ups of the proposed design assignment which will test how people (mostly stakeholders within the design assignment) experience the spaces and how it influences their wellbeing. The latter being tested with the help of an existing wellbeing survey. The virtual mock-ups will be experienced through a virtual reality setup.

Sub-question 3 will be answered through the design process of the rehabilitation center within the urban context of Leiden. A specific building has been chosen based on the capabilities of the overall structure and questions it houses about its future use. The question will be answered by e.g. performing analysis on the existing structure which should show the potentials of the building as well as its challenges to tackle for the realization of the design question.

Literature and general practical preference

Berg, A. E. & Foundation 200 years University Hospital Groningen. (2005). Health Impacts of Healing Environments. Amsterdam University Press. Consulted on March 29, retrieved from: http://www.agnesvandenberg.nl/healingenvironments.pdf

Flies, E. J., Mavoa, S., Zosky, G. R., Mantzioris, E., Williams, C., Eri, R., Brook, B. W., & Buettel, J. C. (2019). Urban-associated diseases: Candidate diseases, environmental risk factors, and a path forward. *Environment International*, 133. https://doi.org/10.1016/j.envint.2019.105187

Hamilton, D. K. J. H. D. (2003). 'The four levels of evidence-based practice." 3(4): 18-26

Herweijer- van Gelder, M.H. (2016). Evidence-Based Design in Nederlandse ziekenhuizen: Ruimtelijke kwaliteiten die van invloed zijn op het welbevinden en de gezondheid van patiënten. *A+BE Architecture and the Built Environment.* TU Delft Open.

Jonas, Wayne & Chez, Ronald & Duffy, Bridget & Strand, David. (2003). Investigating the impact of optimal healing environments. *Alternative therapies in health and medicine*. *9*. 36-40.

Kemper, P., Rompelberg, C., Stoelinga, M. E. E., & Zantinga, E. M. (2021, mei). *Green Deal Duurzame Zorg: Architectuur en inrichting en de gezonde zorgomgeving*. Rijksinstituut voor Volksgezondheid en Milieu. https://www.rivm.nl/documenten/green-deal-duurzame-zorg-architectuur-en-inrichting-en-gezonde-zorgomgeving

Sakallaris, B. R., Macallister, L., Voss, M., Smith, K., & Jonas, W. B. (2015). *Optimal Healing Environments. Global Advances in Health and Medicine*, 40–45. https://doi.org/10.7453/gahmj.2015.043

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Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., ... & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *HERD: Health Environments Research & Design Journal,1*(3), 61-125.

Universitair Medisch Centrum Groningen. (z.d.). Psychomotorische therapie (PMT) bij psychische klachten. umcg.nl. Consulted on April 4 2022, retrieved from: https://www.umcg.nl/-/psychomotorische-therapie

RIVM. (2018). Volksgezondheid Toekomst Verkenning. Consulted on March 29 2022, retrieved from: https://www.vtv2018.nl/

Watson, Kelly. (2018). Establishing psychological wellbeing metrics for the built environment. *Building Services Engineering Research and Technology*. 39. 014362441875449. 10.1177/0143624418754497. Consulted on March 29, retrieved from: https://www.researchgate.net/publication/322658639_Establishing_psychological_wellbeing_metrics_for_the_built_environment

Reflection

The graduation project relates to the main theme of the studio topic (Second Life), which researches the possibilities of the existing building stock and what it can offer as a more circular design approach to new building projects, by analyzing the potentials of creating a healthcare type building within an existing building context. The technical challenges that will occur with this approach are there to be researched within the Architectural Engineering studio. Redefining the architecture of existing buildings within this project can be seen as the connection to the main master track (Architecture). All this together with researching the healing possibilities of architecture which embraces the current trend of redefining the architecture of healthcare buildings. It is the latter trend which can be seen as an ongoing development in itself which this graduation project wants to contribute to.