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	**Esmee Johanna Maria Heemskerk**
Student number	5079543

Studio		
Name / Theme	Designing for care – towards an inclusive living environment	
Main mentor	Kobe Macco	Architecture
Second mentor	Maria Meizoso Aguilar	Building Technology
Third mentor	Leo Oorschot	Research
Argumentation of choice of the studio	After having experienced a long-term sickness myself while staying in a hospital and having multiple grandparents suffering from dementia and Alzheimer's disease, I believe that the healthcare buildings could be more humancentric in design. The first studio session taught me that user-based design in health and care spreads so much further than just the healthcare industry; everyday life, and the buildings we encounter could influence our health as well, for better and for worse.	

Graduation project	
Title of the graduation project	Studying and being well
Goal	
Location:	Delft, TU Delft Campus
The posed problem,	[Problem Statement]
research questions and	[Research Question]
design assignment in which these result.	[Design Assignment]
About 90% of our lives are spend indoors: at home, at work, or for leisure (Rice, 2019). Many standards and guidelines have been set up for these typologies, but educational buildings are often left out. A study by the University of Maastricht concluded in 2018 that the indoor climate of primary schools in the Netherlands is subpar. The measured CO2-levels were way above the established margin (Van Atteveld, 2022). Around 2009 a project called the "Frisse Scholen" was started by the then Chief Government Architect Liesbeth van der Pol to create guidelines for better indoor climates in primary, secondary, and vocational education buildings (Binnenlands Bestuur, 2011; Rijksdienst Ondernemend Nederland, 2021). However,	

universities have not been considered for the project, while university students also need healthy study environments. Research of Heijer et al. (2016) concluded that about 30% of the existing university buildings are below standard when compared to the European and Dutch building norms.
Many students also suffer from stress, though not only from factors introduced from education (Aalbers, 2023). These stressors can severely impact the academic performance of the students. Healing elements in the design of university buildings could decrease the stress of students (Zhong et al., 2022).

Research question: How can the architectural and built environment design of a university educational building improve the physical and mental well-being of its students?

The result of the research will be design guidelines for a new general university educational building that takes the physical and mental well-being of the students in account.

Process

Method description

In order to answer the stated research questions, a theoretical framework about study spaces on a university campus and their impact on the mental and physical health of students is needed. This framework will be constructed using a literature study. This will give an understanding of the current research on the health of students and the influence of the spaces they use, as well as the practiced concepts for the design of university buildings.

Next, an in-depth literature study will be conducted on the existing standards and guidelines for the design of schools and offices. The standards and guidelines that will be discussed are the "Frisse Scholen" and the WELL-standard.

Lastly, anthropological research methods and case studies will be conducted. During a fieldwork week, three educational buildings of one campus in the Netherlands will be used as case studies, each day a different building will be the subject of study. During the day, students attending the building for studying will be asked to fill in an anonymous questionnaire. This questionnaire will focus on the study spaces the students use, their motivation to use said spaces, their preferences for a study space, and their stress and how the study environment can influence them. This is a voluntary decision, and no compensation will be given to the students for filling in the questionnaire. Next to the questionnaire, about 15 students will be interviewed on the same principles with open questions to get an in-depth view on their preferences and opinions. These students will also be asked to sketch and describe their ideal study environment.

In the meantime, the use of the study spaces will be observed and catalogued. This will be done both textually and visually with drawings. This will give an insight into the use of the spaces and if the spaces are of the right size.

In addition to interviewing students, two experts on designing a healthy indoor climate for schools will also be interviewed. These interviews will cover the potential of the "Frisse Scholen" guidelines for designing a university building.

Literature and general practical references

Awada, M., Becerik-Gerber, B., Liu, R., Seyedrezaei, M., Lu, Z., Xenakis, M., Lucas, G. M., Roll, S., & Narayanan, S. (2023) Ten questions concerning the impact of environmental stress on office workers. *Building and Environment, 299*, 109964. https://doi.org/10.1016/j.buildenv.2022.109964

Lau, S., Gou, Z., & Liu, Y. (2014). Healthy campus by open space design: Approaches and guidelines. *Frontiers of Architectural Research, 3(4)*, 452-467. https://doi.org/10.1016/j.foar.2014.06.006

Regehr, C., Glancy, D., & Pitts, A. T. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders, 148(1),* 1-11. https://doi.org/10.1016/j.jad.2012.11.026

Rijksdienst Ondernemend Nederland. (2021). *Programma van Eisen Frisse Scholen*. Rijksdienst voor Ondernemend Nederland.

Taylor, I. (2016). *Future Campus: Design Quality in University Buildings.* Riba Publishing.

Well. (n.d.) *WELL Standard.* WELL Standard. https://v2.wellcertified.com/en/wellv2/overview

Zhong, W., Schröder, T., & Bekkering, J. (2022). Biophilic design in architecture and its contributions to health, well-being, and sustainability: A critical review. *Frontiers of Architectural Design, 11*, 114-141. https://doi.org/10.1016.j.foar.2021.07.006

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The studio theme does not only cover healthcare buildings, but it is also about staying healthy and improving the quality of life. My research subject is about the improvement of the physical and mental well-being of university students with architecture. The research will result in design guidelines for a university building, which will be designed afterwards. This ties in with my chosen master track, Architecture. The design will be an architectural design with integrated building and climate technologies.

2. What is the relevance of your graduation work in the larger social, professional, and scientific framework.

While there are many standards and guidelines for building typologies, schools are more or less underrepresented. The Frisse Scholen guidelines have been set up in the Netherlands to improve the health and indoor climate of primary, secondary, and vocational schools, but universities have not been included. The governments let the universities themselves create their sustainability goals, however, these are mainly focused on sustainable energy and behavior. This leaves a gap in the standards and guidelines for the design of university buildings.