Jan-Willem van der Male  
graduation thesis

INSIGHT STUDIO

In pursuit of “ideal” spatial conditions for the studio space

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Preamble

This is it, the final thesis for my graduation.

After my graduation of my bachelor at the Hogeschool Rotterdam and after one year of working at an architectural company I decided to get back to school again. This time I wanted to learn how to design and I thought I could do so at the TU Delft.

In my first year I had to work in a very eclectic environment. After the fire the pre-master courses were spread all over the campus. I had to travel a lot and had to adapt to many different working areas. All this mess caused me to fail the pre-master.

The second time I was working in another “temporary” situation what has now become permanent: The building at the Julianalaan. This new working environment inspired me to do great work. I passed the semester relatively easy.

After completing this semester succesfully I had the chance to do international workshops in Barcelona and later in Copenhagen. Again I had to work in different environments.

It seems that my academic past has brought me towards my graduation topic: Insight studio. A research into the ideal conditions for an ideal studio.

To the reader: I wish you a lot of fun reading what I have found.

Sincerely yours,
Jan-Willem van der Male
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Background

Msc 2 History Thesis
For my Master two history essay I have written about the studios within the master track of architecture at the TU Delft. The main question was: “What can be done to make it easier to choose a studio within the master track of architecture?” Together with Dominique van ’t Hof I wrote about the history of the architectural design education at the Technical University of Delft. It seems that throughout the history the model has never really changed. From the start of the school students have worked on design projects in small groups with teachers. Up till now there have been several additional subjects, lectures and workshops but the studios have always been there. The studios have been structured within several systems starting from one specific design methodology until 1953 (Delftsche School) into many different studios introduced in 2002 with the Bsc-Msc structure. Today we deal with thirteen different studios within the track architecture only. Each studio has several programs that change every year. The fact that there are so many studies and programs and just two or three opportunities to choose one of them makes it hard to choose. This is not only because of the many studios, but also because of an unorganized way of informing students about them.

Msc2 van Gezel tot Meester
When I did this semester with Elise van Dooren and Luc Willekens I got interested in the world of teaching. I was curious about how you would teach people how to design. There are many different ways and they can all be the right way. So teaching how to design isn’t about educating with knowledge only. You would have to teach the student to have some sort of attitude.

In this semester we worked in 1 group and played the role of tutor with our own students. This way we would learn how to ask the right questions and help the other students in their designs. This is where I got interested in the effect of the spatial conditions of the space on education. I saw that the place where you teach has some sort of effect on the teaching itself. We were almost always in a crowded place with a lot of noise. It seems that the spatial configuration the TU has now isn’t appropriate for teaching in groups. The arrangements of tables and the size of the spaces are different everywhere in the building. Still in the smallest spaces it is almost impossible to talk to the whole group. So many teachers start giving individual teaching and sometimes split the group up in smaller discussion groups. This phenomenon will be the starting point of my research. I want to know how the spatial configuration influences the teaching.
Aim

School of Architecture

The aim of the whole graduation project is to design a new school of architecture for the faculty of Architecture at the technical university of Delft. It is similar to the contest “building for bouwkunde” which was held after the fire of the faculty of architecture at the TU Delft.

The research of this graduation project will be about the most essential spaces in the school, the studios. This is the place where students supposed to spend most of their time. This is where teachers come to educate the students. Therefore it is important to design a studio space that fits the needs of students and teachers.

Currently the faculty of Architecture is a temporary solution after the fire. Because of economic reasons this temporary state has become permanent. This transition from temporary to permanent has caused a lot of interesting solutions to the working environment of students and staff.

The research will search for the qualities of the studio spaces within the faculty of architecture, but also of other schools of design. Finally these qualities will merge into the design for the new school of architecture and thus creating the “ideal” studio space.

School, and especially the studio space, is a place to go and connect to other students to exchange thoughts and ideas. If this is not designed well, you loose quality in education. Students who stay at home don’t get inspired enough by other students and teachers.

I want to design the most suitable studio space and with that design a good school for architecture.
How can the spatial configuration of the studio space accommodate the design education of an architectural school?

Answering this question needs several topics to be addressed. The most essential part is analysing the spatial configuration of existing design studios. Prior to analysing the studio space an understanding is needed on how these studio spaces find their shape within the architecture of the school. This architecture fits the needs of the institutional power of the school and its curriculum.

From the research into the four following topics a conclusion can be made which can be used for the design of the new architectural school.

Institutional power

The institutional power of design education has great influence on its curriculum and architecture. Decisions made by the “higher hand” cause effects on the way teachers and students should interact. Analysing the institutional power can be done by addressing the following topics:

Private vs Public
Is the school government funded or privately funded?

Commercial vs Non-profit
Is the school commercialized and based on making profit or is it like an organisation that aims to serve the students?

Dictatorial vs Communal
Is the organisation of the school like a dictatorial business model or based on a community making decisions together?

Elite vs Populist
Is the school intended for all people or only the top performers?

Curriculum

The curriculum of a design school is a set of courses with its content. The way the institution strives to reach the targets can be found through several topics:
- The amount of students and subscribers,
- The degree and amount of years set for the study,
- The degree of acceptance or tests or age for acceptance,
- Horizontal or vertical studios,
- Combination of atelier and courses
- Individual work versus group work.

Method: searching the internet and interviewing experts.
Architecture

The architecture of design education says a lot about the ideas of this school. In case of re-use the management has to adjust their ideas or the inside of the school. Is a school one big icon or a composition of different buildings? The architecture from the outside and inside can say a lot on how the school works. The architecture also has direct consequences for the studios and the curriculum.

Method: analysing plans, sections and history of schools.

Studio space

The main focus of the research lies on spatial analysis of the studios in different schools of design. The aim of this part of the research is to find the “ideal” spatial conditions for the studio space. When doing research on the spatial properties of the studio spaces one can not make any conclusions by just measuring the room. To be able to compare the studios a qualitative research is needed. Each studio will be looked at through several aspects that in combination create a good studio space. These aspects are:

Plans and sections
When a room is too small it becomes claustrophobic, but when the room is too big you get annoyed by the noise of other students.

Ethos (first impression)
The first impression of a space last the longest. The impression can play a role through time as the student keeps entering the space.

Description
A small description tells something about the qualities of the room. Topics like room conditions, attributes available, activities possible etc. The most basic qualities of a room are the conditions. Light, sound, temperature and fresh air.

Flexibility
The flexibility of the studio is important for the future design. How flexible should a studio space be? And what kind of flexibility?

Conclusions
All these aspects will be compared and a conclusion will be made on how well the spatial configuration makes a contribution to the practices that take place in those studios. This conclusion also makes a statement on the flexibility of the room and if there are any special features that make the studio unique.

Method: visiting and analysing the spatial properties of the studio spaces.
School profiles

Research into various topics like institutional power, architecture, curriculum and finally the studios can become very confusing. To make it possible to define the relationship between all topics a profile is made for each school based on various subjects as mentioned before. Each individual topic can be compared easily between schools, but the whole profile of one school can say something about the relations within that school. For instance a school that re-uses an old building may have to adjust their curriculum in order to fit their institutional ideas. Or they may have to reconsider the spatial properties of their studio spaces. And by that the school can adjust their studio spaces. This relationship between the topics is never really obvious so this research aims to analyse and compare the individual topics of all schools.

During the final design an idea can be created on how the profile of the new school of architecture should look like and how the relationships are made between the topics.

Schools visited

The schools that have actually been visited can provide with insight into its building and architecture as well as the studio spaces. The visited schools are:

L’ecole Nationale Superieure des Beaux Arts Paris, France.

Technical University faculty of Architecture Delft, Netherlands.

Southern California Institute of Architecture Los Angeles, USA.

Schools unvisited

To get a more diverse picture of all profiles, three schools have been added to this research. Since they are not actually visited they are only described through the profile. The unvisited schools are:

CEPT university faculty of architecture Ahmedabad, India.

Cooper Union school of architecture New York, USA.

Architectural Association school of architecture London, UK.
L’école Nationale Supérieure des Beaux Arts Paris, France

Institutional Power

- Public
- Non profit
- Communal

College fee €

| 0 | 780 | 30000 |

Architecture

Curriculum

- Number of students: 550
- Number of subscribers: 120
- Vertical/horizontal studios: Students of all years mixed
- Group vs individual: Group 30%, Small group 20%, Individual 50%

Studio Spaces

- Atelier/courses: 90% in atelier, 10% self-study
Architecture
The school is made up of a vast, highly diversified complex of buildings. They are spread out over an area of more than 2 hectares between rue Bonaparte and the quai Malaquais, and date from the 17th, 18th and 19th centuries, some even from the 20th.
Atelier James Rielly
L’école Nationale Supérieure des Beaux Arts
Departement des pratiques artistiques

**Plan**

[Plan drawing]

**Description**

What is evident is good natural light from the side and extra strong work light. The students can work in the quietness they need. The room conditions don’t show any problems. It is obvious this studio is used for painting. The studio is appropriate to work and watch the paintings, but not to present them. The room is good enough for 6-8 students. The whole studio is also a place of storage. There are enough chairs and tables present, although they are all used for storage.

**Impression**

“private”
personal
messy
Atelier Tania Bruguera
L’école Nationale Supérieure des Beaux Arts
Departement des pratiques artistiques

Plan

Sections

Description
Because of the many windows, extra artificial light is not needed. The temperature, acoustics and fresh air are good.
The studio seems to be some kind of presentation space where the students can hang out and make plans.
The kitchen makes it possible to prepare food. There are about 7 students present. It’s doesn’t seem possible to work individually. The studio is for group work.

Impression

very light
white
clean
Atelier Claude Closky
L’école Nationale Supérieure des Beaux Arts
Departement des pratiques artistiques

Plan

Description
The natural light comes in through windows from the top. The room uses extra artificial light. Because of the height there is a good temperature and noise cancelation. It seems possible in this studio to work on projects with heavy materials. But the room is also appropriate to give presentations. The room is good to hold about 10-15 students. The similar studio space on the other side had a group meeting with about that number of students. There are enough tables and tools to work on art pieces.

Section

Impression

undefined
high
empty
Atelier Modelage  
Patrice Alexandre  
L’école Nationale Supérieure des Beaux Arts  
Département des technicités

Plan

 Sections

Description
The high ceiling makes it possible for the smoke to disappear. But the room is a pretty dark and messy place. It is also very warm because of the melting of materials. It is obvious this place is for modelling sculptures of different kinds of materials. The room is also appropriate for storage.

There are around 5 students present, but the room can hold up to around 10 students apparently working on individual sculptures. There is also water available and stoves for melting materials needed.

Impression

curious

smell

smoke
Atelier Moulage
Philippe Renault
L’école Nationale Supérieure des Beaux Arts
Département des technicites

Plan

Description
As mentioned the light conditions are there, but artificial. There is only one window present. The noise, heating and fresh air conditions are good. This room seems to be specializing in moulding, making copies out of plaster for further work. It is also possible to paint the artworks. Only one person was working in this atelier, but it could very well hold 5-10 students. There

Section

Impression
very light
church like
tidy
Flexibility

All studios of the Beaux Arts seem to be flexible in the sense of moving furniture around. If tables and chairs are put aside then a small presentation is possible. There are no permanent objects in the rooms besides walls. One studio has a small kitchen, but that is aside of the studio.

The studios are less flexible when it comes to the amount of students they can hold. The biggest studios can hold ten students. That is mostly due to the small rooms and the amount of working space each student needs.

Spatial Properties

The spatial properties of all studios are serving the function of the space. Students can paint, sculpt, draw, present and work on all sorts of art works. The studios also function as meeting place where students and teacher get together to discuss the assignments.

Most studios have natural light coming from the roof or from big windows, mostly oriented to let the light enter indirectly. The height of the spaces makes it possible for any smoke to leave the room. It also allows tall windows.

Some studios have special spatial features like an entresol, a kitchen, curved ceiling or other features. These features allow for extra program to be added to the studio. The kitchen clearly creates a living room for the students. An entresol creates a division between the art works and an “office” space where students can work on laptops to find inspiration or do some research.

The spatial properties of the studios of the Beaux Arts can be described as: small, tall, light and function specific.
Architecture
After the fire of the old building of the faculty in 2008 an old building was re-used for the new faculty of architecture. This state monument was re-designed by five architects: Braaksma & Roos, Fokkema archiciten, Kossmann de Jong, Octatube Int. B.V. and MVRDV. The building had to be designed within a very short amount of time. The old buildings interior was stripped and organised into large studio areas. Two new hot-houses were introduced to create new workspaces. The old boiler house was transformed into a restaurant.

Plan

Bouwpub 18th century
Ketelhuis 18th century
Zuid Serre 21st century
Berlagezalen 18th century
Library 18th century
Oost Serre 21st century

Sections
02 west
Technical University Delft, Faculty of Architecture

Plan

Section

Description
On both sides natural light enters the room through rather small, but many windows. The temperature and fresh air are good. Students might have troubles with each other’s noise.
Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers.
The tables can hold 10 students per table and would cause a lot of noise when all students are present. There seems to be a clean desk policy causing all works of students to be pushed into the small storage closets.

Impression
stretched
repetition
overview
01 west 200
Technical University Delft, Faculty of Architecture

Plan

Description
Two sides of the room contain large windows, allowing natural light to enter the space. The temperature and fresh air are good. Students might have troubles with each other's noise. Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers. The tables can hold 10 students per table. There seems to be a clean desk policy causing all works of students to be pushed into the small storage closets.

Section

Impression
silence
light
proportioned
BG west 170
Technical University Delft, Faculty of Architecture

Description
On both sides natural light enters the room through rather small, but many windows. Students might have troubles with each other’s noise. Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers.
The tables can hold 10 students per table. There seems to be a clean desk policy causing all works of students to be pushed into the small storage closets.

Impression
not too big
quiet
light
BG+ oost 700
Technical University Delft, Faculty of Architecture

Plan

Description
On both sides very less light enters the room through rather small windows. The temperature is too high and makes it a bad place to work. Students might have troubles with each other’s noise.
Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers.
The tables can hold 10 students per table. There seems to be a clean desk policy causing all works of students to be pushed into the small storage closets.

12 m

18 m

Section

2.5 m

Impression

warm
low
dark
**Oost Serre**
Technical University Delft, Faculty of Architecture

**Plan**

**Description**
Because of the “hot-house” construction a lot of light enters the space, but the size causes a lot of noise in order to work well. Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers. The tables can hold 10 students per table. Opposed to all other studios the students are more present.

**Section**

**Impression**

very big
orange
big tribune
01 oost 560
Technical University Delft, Faculty of Architecture

Description
On both sides natural light enters the room through big windows. The lack of sunscreens causes the room to heat up and make it impossible to read the computer screens. During bright summer days this studio gets very hot. Students for sure have troubles with each other’s noise. Possible to work on your laptop, draw sketches, work on models, get coffee, do presentations and print A4 or A3 papers. The tables can hold 10 students per table and would cause a lot of noise when all students would be present. There seems to be a clean desk policy causing all works of students to be pushed into the small storage closets.

Impression
- spacious
- noisy
- direct sunlight
Flexibility

Most studio spaces in the faculty of architecture at the TU Delft are flexible in the sense of multiple users. Big tables throughout the whole school provide with working space for all students. Even though the table numbers are assigned to your “studio” the student is allowed to work anywhere. But the student is not allowed to leave stuff on the tables. The big tables are impossible to be moved due to the electric points for the tables. Moving tables would mean: removing power. The studios have specific storage places and specific presentation bars, mounted above the tables. One of the studio spaces is different. Here the power points are integrated into the floor and all furniture can be moved around freely. This happens a lot when lectures are given on the big tribune in the centre of the studio space.

Spatial Properties

The faculty has several types of spatial properties of the studios. Some studios are big and stretch out throughout whole floors while other studios are more subtle causing the noise of students to be less problematic.

The big studios are useful when it comes to contact possibilities with other students. Almost constantly students walk back and forth through the space to get something they printed out, to drink some coffee or to talk with someone at another table.

When it’s crowded in the studio students can only work individually with a personal “space” by the use of earplugs with their own music. There are limited smaller spaces for individual retreat, but those are intended for small lectures and presentations.

The large amount of windows on each floor provides with plenty of natural light to enter the studio spaces. Since the light comes from all direction sunscreens provide with the ability to adjust the amount of direct light.

The big tables have a certain influence on the way teachers teach. The teacher is most likely to give individual tutoring. When the noise of the space is less then teachers attempt small lectures to groups.

The presentations that have to be held in the same space are usually going well, but the distance between the tables is rather small. So it is not possible for every student to watch the presentation properly.

The spatial properties of the studios of the faculty of architecture can be seen as spacious, light, occasionally noisy and generic in function.
Southern California Institute of Architecture Los Angeles, USA

institutional power

- private
- non profit
- communal

architecture

curriculum

- number of students
  - 500
- number of subscribers
  - 100
- vertical/horizontal studios
  - separated and mixed
- group vs individual
- atelier/courses
  - courses in atelier 90%
  - self study 10%
Architecture
Built in 1907, the depot was designed by Harrison Albright, a pioneer in the use of reinforced concrete, as a railroad freight depot. At 380 m in length, the building is so long that, if it were upended, it would be as tall as the Empire State Building. The building had 120 bays with opening on both sides, allowing freight cars to unload on one side while trucks were loaded on the other side. In 1990 the building was stripped to its concrete and abandoned until SciArch settled in this building in 2000.

Plan

material shops  main space  gallery

first year  vertical studios  administration

Sections
first year
Southern California Institute of architecture

Plan

Sections

Description
The first year studios are separated into smaller rooms, but still connected on the window side. The room is completely empty at the beginning of the year. Then all students can come in with their own desks, chairs, computers etc. Because of the separation students can work without too much noise of the other students. The fact that these studios are allowed to get messy makes them suitable for their goal: working on architectural design. The messiness results in a personalized studio space.

Impression

very messy
personal
free
undergrad thesis
Southern California Institute of architecture

Plan

Sections

Description
During the undergrad thesis students are set together in spaces divided by semi-high walls. These working spaces can best be compared to office cubicles. Due to this set-up students can work in a relatively individual studio space. This cubical set-up makes the studio a bit less social, but makes it better for students to work on their thesis. The windows are blocked with sheets to block the sun from enlightening the computer screens.

Impression

cubicals
personal
less social
vertical studio

Southern California Institute of architecture

Plan

Sections

Description
The vertical studios are the most artistic spaces in the whole school. The places are filled with personal items which students bring to their school. Again you can see a very messy studio. The space in itself is like the first year studios, except for the dividing walls. Students work in groups and therefore the space is big and open.

Impression

artistic
personal
very messy
Flexibility

Sci-Arch has a special way of addressing flexibility. At the beginning of the year students can find their own spot depending on what year they are in. The first year students and the vertical studios are free to change to whatever the students want to make of it. There is no furniture available so all furniture has to be brought in by the people or can be made. Students are allowed to bring their own chair, desks, computers, chairs, refrigerators, coffee machines, etc.

During their undergrad thesis, students can also choose their own place, but this time they kind find their own “cubical”. The students are separated from each other by one and a half meter high walls. So if they stand up, they are still connected and the isles in between the cubicles are making small walks available.

Spatial Properties

Since the school is re-using an old warehouse the interior has adapted to the shape of the building. Where needed, extra constructions provide with second layers of studio spaces on top of existing studios.

The building is high and therefore very spacious. The long hallway, which doubles as presentation way, connects the studios and other facilities in the building.

During the “vertical” years, teachers work with students from different years. They coordinate their studio set up to match the way the teacher would like to teach.

There’s room for individual tutoring and group lectures to groups of around ten to 20 students.

Because students bring their own items of comfort, like a refrigerator, the studio has become a living room. Some students actually sleep over there too.
CEPT university faculty of architecture Ahmedabad, India

institutional power

- public
- non-profit
- dictatorial

architecture

curriculum

- number of students: unknown
- number of subscribers: unknown
- vertical/horizontal studios: separated and mixed
- group vs individual: group, small group, individual
- atelier/courses: atelier 60%, courses 40%

studio spaces
Cooper Union school of architecture New York, USA

**institutional power**
- private
- non profit
- dictatorial

**curriculum**
- number of students
  - 1000
- group vs individual
- 35%
- separated and mixed
- 65%

**architecture**

**studio spaces**
Architectural Association school of architecture London, UK

Institutional Power

- Private
- Non Profit
- Communal

College Fee €

Curriculum

- Number of Students: 500
- Number of Subscribers: 65
- Vertical/Horizontal Studios
- Atelier/Courses: 80% in Atelier, 20% Self-Study

Studio Spaces

Research conclusions

General conclusion

Profile relationships
The aim of the whole research was to find the necessities for an ideal studio space within a school of architecture. The profile of 4 topics was meant to find possible relationships between aspects of an architectural school and the design studio. These topics are Institutional power, Architecture, Curriculum and the design studio itself.

The general conclusion of this profile research is that there are no substantial relationships between the different aspects and the design studio. Of course there are relationships between the aspects, but they would need further research to make them substantial.

Even though there are no substantial results on the relationships between the aspects and the studio space, there is enough to be said about the aspects themselves individually. These conclusions can be seen on the next few pages.

Studio space
Fortunately this research has brought a lot of substantial results about the studio space itself. These conclusions are shown in the chapter: “studio essence” which also answers the main research question.

The most important aspect of the design studio is the flexibility towards the use of the space when it comes to education. There are several scales of education that needs to be solves through the design of the studio spaces. These are the first three scales addressed later on in the chapter: “design recommendations, education scales”

Design goal
The education scales are dealing with the interaction between student and teacher, but also the interaction between student and student. Therefore the most important design goal is to accommodate the interaction on several scales through the whole design.

This interaction is needed to provide students and teachers with a reason to be present at school, because the presence at school is the most important issue when it comes to the education of design.
Research conclusions

Institutional power

**Public vs private**
The public schools are funded by the government while private schools are initiated by individuals.

**Commercial vs non-profit**
All schools claim to be non-profit organisations. And yet some schools are managed through business like structures with dictatorial ways.

**Dictatorial vs communal**
As mentioned before the dictatorial organisations are like business entities. The communal schools act like small groups who involve every person into their organisation. Together they strive to make a better school.

**College fee**
The college fee shows big relations to the public or private basis of each school. College fees of private schools are incomparably much towards the public schools. Some schools like Cooper Union claim to be free for all to attend and yet they allow only the best to enter their school. The Cooper Union gave out scholarships for the first 150 years.
Research conclusions
Curriculum

Students and subscribers
The amount of students and new subscribers has the same proportions in all schools. Around 20% of students are first year students.

Vertical/horizontal studios
The mixture or separation of students of every year is different for each school. What the separation or mix is based on is not clear.

Group/individual work
In all schools group work is the essence of the curriculum. In the end it is about the individual graduation, but working together is necessary in all schools of design.

Atelier and courses
Most schools integrate the courses (knowledge) into the atelier projects. Only the TU Delft and the Cooper Union separate the knowledge from the project, maybe due to their technical and scientific character.
Research conclusions

Architecture

Re-use
All schools of design have a tendency to re-use existing buildings. They adjust it to their needs and make it work. This way of adapting to existing structures is seen a lot in the world of design. The TU in Delft used to be facilitated in designed school for architecture, but the fire forced them into a re-use model of facilitating. Before the fire the old building was also adapted to give room for the growing amount of students.

Program
The kinds of spaces inside the buildings are related to the way the schools follow their curriculum. The schools who have integrated courses in their projects seem to have less lecture rooms then the schools that separate courses and project.
Research conclusions

Studio spaces

Impression
Most studio spaces are in a state of “low entropy”. This means energy is scattered over a big area. The opposite “high entropy” is when a lot of energy is concentrated in a small area. This low entropy can be seen as: “messy”

Flexibility
Each school has its own approach towards flexibility of their studios. There is a difference between the organisations of the room versus the use by different students through time.

Spatial properties
The Beaux Arts is a school with small specific studios in contrast to the TU and Sci-Arch where many spacious studios with a more broad function are situated.

Comfort
The comfort is the studio can be seen as attributed like a couch, kitchen or other life comforting equipment. In the TU these objects are provided by the school. In other schools these objects can be brought from home.
Research conclusions
Studio essence

How can the spatial configuration of the studio space accommodate the design education of an architectural school?

The answer to the research question is an issue of safety. In order to work well in any given place, you need a safe environment to work well. This environment consists of three kinds of safety as you can see them below. So the answer to the research question is: Providing with the necessary safety in order to educate in architectural design.

Basic safety
The studio can accommodate design education by providing with the basics of any building. Protection from outside and indoor climate control. These aspects can play a role in creating a light, non-noisy working environment.

Workable safety
The studio space should provide with the right tools such as tables and chairs and some basic comfort like lockers and a coffee machine.

Social safety
The most important aspect of a design studio is the ability to interact with the people around you. You learn the most from them so it is important for a studio to provide with the right conditions to interact. These conditions are about the ability to have personal tutoring as well as group presentations. So the studio space should be flexible enough to meet those demands.
**Research conclusions**

**Studio spatial configuration**

**Room size**
The visited studios show a variety of room sizes. The image above shows the studios from small to large by area and height. When the studios are “too small” it means that the space is very intimate and mostly used for specific practises. It also allows for just a small amount of students to work in the space.

The studios that are “too big” or “too high” have a negative effect on the workability. The noise of fellow students becomes too much for other students to work well on their projects. These room sizes also make the space more anonymous.

The ideal range of sizes reaches from 80m² till 120m² and a height between 3 and 6 meters. These sizes make sure for the right balance between intimacy and anonymity.
Research conclusions

Tools
The image above shows the most essential tools for a studio of an architectural student. These tools consist of a model work table, an individual work table, storage and presentation walls.

The left set up on the image below shows the amount of tools needed in a studio space of 10x10m (the average “ideal” room size”). The images to the right show varieties of set ups.

This study of tools versus space shows a maximum amount of 12 students. This number works well in working in small groups (2x6, 3x4, 4x3 and 6x2). This contributes to the flexibility of the studio.
Research conclusions

Studio flexibility

Flexibility
Most important for the ideal studio space is the flexibility of the room. Previous studies show the room size and tools, but a good flexible studio also needs other important aspects such as adjust ability of the spatial properties. This can be done by introducing adjustable walls or curtains. A possibility to achieve this is by adding rails in the roof on which walls and curtains can be attached and moved.

Also the furniture inside the studio should be able to be moved. To be able to move the furniture and still have power the power should be provided from sockets in the floor instead of the walls. The walls should be used for presentations and windows to provide the room with natural light.

Other aspects like wireless internet and good artificial light speak for themselves.

Besides adjusting the room itself it can also be wishful to combine the studio space with other studio spaces in order to accommodate different kinds of didactic settings such as workshops.
Research conclusions

Design studio impression
Design recommendations

Education scales

Design education is about the relationship between student and teacher, as well as the relationship between student and student. These relationships act through different scales of education which should be part of the final design.

1. Individual tutoring (1on1)
2. Small group discussions and presentations (1on4)
3. Studio group lectures (1on12)

These “scales” of education should be facilitated in the studio space. To facilitate those various scales it is important that the studio is flexible enough to adapt to the demand of individual tutoring (small space without noise) to studio group lectures (classroom with limited noise). This scale issue can be solved through good architectural design and with the results of the studio essence.

4. Studio interaction (4x12)
The fourth scale is about the interaction between several studios. To achieve this, a common area or “living room” can connect the studios creating new means of communication through a central place where students meet with their fellow students. The interaction between studios is important to generate new ideas from different angles towards different topics.

5. Community; theme based interaction
Dealing with a large school and many students requires a good approach on the organization of the education. Even though studio interaction is possible between studios by introducing a living room it could also be theme based on a larger scale. This can be done by creating clusters of studios that deal with the same theme. Such themes could be: renovation, public building, dwelling, technology, etc. Connecting the living rooms vertically could create vertical themed “pillars” with studios attached to it, thus creating communities.

6. School; communities’ interaction
The themed clusters need to interact with one another. Since the amount of studios per cluster is different every year they need to be able to adapt to new situations. Exchanging studios between communities is a way to make that possible. This is a configurational issue.

Another issue is the communication between communities. A helpful tool is to create a “forum” for the entire school where teachers and student from different communities can get together and discuss issues that deal with the entire school.

7. Facilities
Finally the faculty of architecture should have proper facilities to complement the education of architectural design. Facilities like a model room, tech-lab, library, lecture room, etc. But also facilities like a restaurant, café, pub, lounge, etc should provide with the needs of students and teachers.
Design recommendations

School profile

The recommendations about the school profile for the new school of architecture of the TU Delft should be as following.

A public school, non-profit and communal instead of dictatorial (business model). The school will be holding around 3000 students. This is just like the current condition and due to the public character. For the quality of the education a smaller amount of students would be recommended. But this large amount will contribute to a more complex design to find a way to achieve better quality for all students.

A communal organisation means a bottom-up approach to the way students are being thought and organisational choices are made. Due to the amount of 3000 students the school should have a design on how communities can be divided in sub-communities that form a chain to finally act from the individual student to the whole school. This design of communication is essential for the new building of architecture. The scales of education will provide with the necessary design issues.

Students need to learn how to design, this is the core business of the school, so pure group work is not allowed. Students need to learn how to design individually and how to do research with a group.

The studios are separated and mixed. The first year is separated from all other years to keep the students safe from an overflow of information. The bachelor years after that are mixed to learn from each other. The same is applied to the master years.

The courses and ateliers are partially divided. 15ects is earned through design in the project inside the atelier. 10ects is earned by courses that are close to the design project. Finally another 5ects is earned by other knowledge courses.

This has an effect on the architecture of the building. Projects need studio spaces and courses need lecture rooms. So throughout the building 15% of lecture rooms should be added. The courses inside the studio need the studio to be a closed space in order for the teacher to give lectures.
Bibliography / references

The use of theory and expertise
This research did not use theory directly to come up with conclusions and statements. The theory and expertise was only used to find helpful ways in doing research.

Theory
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Epilogue

I hope you have enjoyed reading this graduation research and that it has brought enough insight into the design studio and architectural education. I will now work on my design in order to graduate.

After that I will start working at an architectural company in Rotterdam: Public Domain Architecten. I hope to learn a lot and find opportunities to one day have my own studio.

I want to thank the TU Delft and the teachers. Special thanks to Elise van Dooren and Luc Willekens for their great tutoring during my graduation.

Sincerely yours,
Jan-Willem van der Male