The woodworking workspace
A big part of the crafts school for woodworking are the workshop spaces. In these students learn to create and fabricate projects. It is important for these spaces to be didactic in order to stimulate learning and creativity for students. This means that these spaces have to be both pleasant and functional. But what makes a space pleasant to work in? And how were these spaces organised throughout history? By analysing and describing what the properties of a woodworking workshop are we can get an insight on how to design these spaces for the new crafts school.

Dimensions and material have a close relation to the spatial qualities of a workspace. It can help students at a craft schools focussed on their projects and the craft they are practising. - In contemporary times the attention span is getting shorter and shorter.

History
The first signs of woodworking originated from the period in which people started to create wooden products and structures using tools. Naturally, these tools were not one-use products so they needed to be stored somewhere, because there were not a lot of tools no specific storage room was necessary. Tools were likely stored inside of the first places where people settled. The structures people lived in were first huts for shelter and later grew to become farms.

As settlements began to grow further it was not necessary anymore for everybody to farm their own food, because there was plenty. Instead, food could be traded for stuff. This meant that people were able to specialise in creating certain products to survive. This is where you could say the first craftsmen originated from. Logically these first craftsmen needed a place to work and this is where the first real workshop spaces originated from. The original workshop room can be defined as a space where tools were stored and products were fabricated in the same place. These were connected to the residences of a craftsman.

More products meant more food, and eventually people began to employ others to create their products. This lead to the creation of guilds, where the owner of a workshop was the master, and its employees the students. These product were usually made where people needed them, so you could find them in cities where there was not much space. This meant that workshops were small and intimate. Up until the late 19th century these workshops remained small scaled in comparison to the industry we know today.
A change in workspace
In the industrial revolution, first the steam engine and later the motorized engine, changed how industries operated. Machines could replace tasks of workers and do them much faster which would scale up production. But these machines could not replace workers entirely. They still needed to be operated and could only perform one task of the process. It meant that complex work had to be broken down into a process of smaller jobs in order to increase productivity. As machines became bigger the workspaces needed to become bigger and more efficient. New technologies like reinforced concrete and developments in steel made these bigger structures possible. The structural properties of these materials made bigger openings in façades possible, bringing in a great amount of natural light. They required more land use and therefore had to move out of city centres. This created a shift from the small intimate workspaces in the city, to the large open workspaces of industrial area’s. A change in the atmosphere of diligent workspaces.

Two types of workspaces
The shift in workspaces did not mean that the smaller workshops would be replaced by the new open workspaces. There is just another option. Some small workshop did become a bit bigger because of machinery, but remained small and intimate of nature. In small intimate workshops the project is central. It is often literally placed in the centre of the room with all the tools necessary in view and within reach. Before the industrial revolution mainly hand tools were available which made it easy to bring the tools to the project. Modern woodworking shops often have immovable machinery which meant that the process has a different dynamic. In this dynamic the project is brought to the tools. Parts of the project will then be assembled. Machines become the new tools and are sizing up the workspace. Because of this we see the intimate setting converge with the industrial setting. Like the intimate workshops, in open large halls all the tools are visible. Both spaces can be seen as a toolbox but the tools in them are different.

Appearance
The workshop varies in size depending on what tools are used and what is made inside of them. Within the craft of woodworking there are many products to be made and a craftsmen is usually specialized in one field. Some examples of fields are furniture (like tables and chairs), storage (closets),
boats, interiors work (like stairs), art (like carving) and musical instruments. The tools you find in these shops are often defined by the field in which the craftsman is active, although many tools can be used in multiple fields.

**Ambience**

Woodworking workshops serve a practical function and are often designed with that in mind. But, like more spaces they tend to have a distinct ambience or atmosphere. The sensory qualities that a space emits define this ambience and can make a space either more or less pleasant to be in. Which factors play a role in establishing this ambience? If we look at visual input there are many elements to discuss like light, material, functional and social elements. Other inputs that are closely related to materials are touch, smell and taste. Noise can also add to the ambience of a space. On top of that there are also senses that people are not aware of, like proprioception, which gives us a sense of space. This deals with how your brain understands where your body is in space.

1: *Visual sense: Light*

Small workshops seem not to need a generous use of daylight. That might be because of the small dimensions which makes it is easy to light up the room with artificial lighting. Another reason for this might be a practical one related to the sense of touch: daylight can make a small space hot easily and that is not desired. The room is easier to climatize when dark. When interviewing a furniture maker he mentioned not being fond of the big windows at his school, because the machine hall would become too hot with all the people working in it. On the other side of the spectrum we have the large industrial space that is often flooded with daylight. Natural light gives humans a sense of time, both daily and annually. Light has a temperature that has different effects on people. Warm light, like the light a fire emits, creates a sense of comfort and relaxation. Cool light, like daylight, improves mood, energy, alertness and productivity. Next to temperature you have the intensity of light. A low intensity light is called diffuse and is easy to look at. While a high intensity light is harder to look at, for example: it is hard to look directly at the sun because it gives people discomfort. This is because a lot of UV light enters the eye. Besides this, when light hits a material, the material will absorb some of this light, causing it to warm up. A high intensity light will warm up materials faster which will emit warmth over time inside of a building.

1: *Visual sense: Material*

Materials absorb light which gives them a color. If we apply that logic to the temperature of light we can uncover why a room with lots of concrete surfaces feels different from a room with lots of wooden surfaces. We perceive colors because a material absorbs certain light of the spectrum and reflect others. This is what gives wood its color ranging from yellow to reddish colors. These colors have a warm temperature and therefore gives us a sense of comfort and relaxation. This sense is further enhanced by the wooden surfaces that reflect light in all directions, because these surfaces are uneven, creating lots of diffuse light. Because small woodworking workshops are often filled with wooden surfaces they become intimate. On the other side of the spectrum we have the large industrial workplace with lots of cool daylight. Like mentioned before this improves upon mood, energy, alertness and productivity which is wanted in a workplace like this. It contributes greatly to the ambience of the workplace. A good example of this is the workshop of Piet Hein Eek, it uses large windows and light colored floors. Because these floors are light and have a hard surface they reflect light which prevents the workshop from warming up. These bright workplaces share properties that are also found in the concept of Biophilia and are beneficial for a person’s health.
1: Visual sense: Complexity
Visual inputs can also help the creative process for designers. A space with lots of visual inputs stimulate the brain and make it more active. It also reminds the brain of the complexity of nature which has also has positive effects on people, it is also a factor in the concept of biophilia. When applied to hospitals it shows faster recovery times. It improves upon mental health issues because it is interesting (boring places makes people feel uneasy and causes stress). A craftsman called Edward Wohl describes the influence of nature on his state of mind in an interview with Matt Binetti. He draws inspiration from his environment, in this case the countryside, where everyday is a bit different because of the weather making it, as he calls it, a little magical.

In an other interview from Louisiana Channel, Piet Hein Eek explains that he embraces the chaos of his workspace, which has material lying around the entire building. It creates a disruption in the process of making furniture. And it needs creative thinking in order to deal with this. This can be the basis for new ideas that organically form in the workplace. This results in the development of the designs he has made. Some design that he still sells are around for decades, but slowly change over time creating a better product in the end. He explains that he created is own environment in which he functions well. It is a break from the standard production process that focusses on efficiency and instead focusses on material.

2 and 3: Tasting and smelling senses: Material
Tasting and smelling have to do with each other. Although you generally do not eat wood, you will sometimes get some wood dust in your mouth when working with the material. Sawing also breaks down the material releasing particles in the air, creating smell. A scent can trigger strong memories. The reason for this is that the brain regions where smells are processed are intertwined with the brain regions for memories and emotions. To put it in another way: a scent can create a strong relationship to a place, in our case: the workplace. When entering a workplace the smell of it can remind you of a lesson you learned or associate positive emotions to it, which makes the space more pleasant to be in.

4: Hearing sense: Noise
Noise is a big influence on the space. In woodworking there is a lot of noise from banging wood together, sawing, shaving, boring and other sounds from modification you make on wood, and the machines you use. This noise can linger in a space and cause a nuisance. It can reflect off of hard surfaces and reverberate for too long. Luckily, wood naturally works sound reducing - In large spaces where sound tends to get stuck baffles are used to diffuse sound and absorb them because they create extra surface area. These baffles are often made out of soft material like textile or wood that have an uneven texture to them. A complex environment, like a workshop, has the same effect, adding extra surface and texture to a space.

5: Tactile sense: Touch
The influence of touch comes from human instincts. The sense of touch protects our body by signalling potential danger and requiring us to make a prompt response. A touch can make us feel more comfortable and also more uncomfortable and can be related to materials. Hard materials can remind people of rocks which in turn can form a sense of danger, but it also can establish a sense of rigidness, which is a positive

Edward Wohl’s view from his workshop.

association to stability. For example a rigid structure forms no danger of collapsing and relieves us from stress that it might does collapse. When working with wood there is force applied to the material in order to shape it to the craftsman's liking. When a piece of material is fixed into place it makes it more rigid and easier to work with. The same goes for mechanical tools like saws. If machines are not rigid it can create dangerous situations. Like all senses there are multiple ends to the spectrum. Instead of hard, materials can feel soft and textured like fabric or wood. Soft things can make people feel more comfortable and at ease.

6: Sense of space: Dimensions, formal and informal
The notion of proximity and visibility is not only good for the overview of tools a person can use, but it also can stimulate collaboration between students and learning from other students. Simply by being able to watch someone work on something you can learn from it. In large workshop spaces you have a formal setting because you can keep your distance and don’t have to engage with someone. In more intimate settings it is easier to walk up to somebody and talk to them simply because you are closer to them. It makes the setting more informal because it is likely that you will engage with others.

The many tools a woodworker uses give a lot of cognitive input which makes it more exiting to be in that space. But from the outside this is not always the case. In the image you can see the inside and outside of a furniture maker I visited in Schagen. The interior clearly shows what is going on, but the exterior is anonymous and generic. Although, this is quite typical for smaller intimate workshops. These are more inward focussed and you really have to get inside to get a feel of what work is being done here. In this case you can argue inviting clients becomes more informal, because literally the facade of the business is removed. It can create a better connection with the client and this way the client becomes more interested in the craft. On the other hand a facade expresses something about the business, which can gain the interest of people in you, over other businesses. At the end of the line, the craftsmanship in the product should be reflective of the quality of your business, but a good first impression helps in generating that business.

Finally the sense of space is important for the organisation of a workshop. In the interviews I have seen in video's the small workshops often shared one distinct similarity. The workshop was organised in order to the liking of the craftsman. This helps the craftsman with their work flow to make working inside the shop more fluent and more pleasant. Everything has its place and over time the craftsman instinctively remember where all the tools in the workshop are, giving them a great sense of place and flexibility. In industrial workshops more machines are used and are further apart, which does not immediately help a craftsman. But over time there will be a sense of space aswell.

Workshop of Hamers Meubel & Interieur: interior and exterior
Conclusion
The ambience of a workshop dictates what makes a space which more pleasant to be in. When looking at the senses of humans it can explain what makes an ambience good or bad. When entering a space people often immediately get a sense of the ambience because of their instincts. This principle is also used in the concept of biophilia and it results in pleasant spaces that have a positive effect on people, both physically as mentally. They are stimuli to help the body function well.

Diligence and comfort
The two types of workspace: the intimate workshop and the industrial workshop share similarities that makes them pleasant to work in. Both are complex spaces with lots of visual stimuli. The smell and tactile sense is similar and the noise is similar. Light and sense of space are the main differences that creates a different ambience for each type of workplace. It makes the small workshop feel more intimate because of warmer light and informal setting. The industrial workshop feels more diligent and formal. Although these workplaces are usually designed with from a functional perspective, their functional properties cause the spaces to be pleasant to work in. Being aware of the properties that make these spaces so pleasant can give a great input in the design of a crafts school for woodworking.