

Fidget Furniture

Investigating how furniture can aid concentrating in a learning environment.

Compiled Thesis

Version 1

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SAFEX2

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2025.04.10

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Fidgeting furniture | Marvin Cowles

How can furniture aid concentration in a learning environment

Abstract

This master thesis in wood oriented furniture design concerns concentration issues in the western classroom environment and how furniture can extend the users attention span while working on cognitive tasks. The concept of fidgeting and active sitting has been applied onto furniture to offer the user fidgeting activities while sitting. A range of prototypes have been tested on a target group age 8 - 12 and qualitative interviews were held with teaching personal. A single concept was then reworked and adapted to the needs of learning environments based on the gathered knowledge and the regulation EN 1729-1, Furniture- chairs , tables for educational usage, part 1.

Result of this work is a seating furniture that allows the user to fidget while sitting and so help them to extend their attention span while working on cognitive tasks.

Key words

Cognitive task

Fidgeting

Learning environment

Ergonomics

active sitting

aiding concentration

attention deficit hyperactive disorder (ADHD)

classroom

Review and Project Proposal

1. Title:

Fidget Furniture,

How furniture can aid children in concentrating in a learning environment?

2. Introduction:

The human body is not made to sit still and perform only cognitive tasks for several hours per day. The body needs some form of activity in between these sessions of learning. That is why we take breaks from cognitive based activities such as school lessons. Also occupations where a high level of attention is crucial, such as the field of air traffic management, incorporate regular breaks from monitoring activities to prevent distraction.

I will explore different possible activities that can be performed during a learning situation that have the possibility to aid the users concentration. For these activities I will develop results that can be used specifically for these movements and analyse their qualities in aiding concentration.

I define learning situation as such: a situation, usually seated, in a classroom environment, often in a group from 10 to 30 individuals and guided by usually one individual (usually the teacher / lector).

3. Review:

3.1. Review Introduction

Movable furniture: Implementing movement into furniture is nothing unknown or new. There are several design classics that are dedicated to this topic. Often the goal is to offer a physically healthier sitting situation for your body by giving the opportunity to constantly switch sitting positions and so to change the stress that is put on to the spine.

Other furniture focus on the activity of movement as a strategy to keep focused on your work. These specific furniture often address children as their user group. This is the part I will set focus on since my goal is not (primarily) to create a healthy sitting situation but to aid concentration.

When we talk about furniture that moves it is to mention that I also want it to be visible it is a movable furniture. I want to use visual communication to inform the user about the usage or the kind of activity that the furniture can perform.

3.2 Discussion of sources

The greater purpose of this research is it to produce results that aid children in concentrating in a learning environment. The first question I am facing is: "how can I support children in this situation and how can I make sure that my idea will work?". Until today there are several studies that have been conducted in the field of play concerning its educational benefits for adolescents.

Galen Cranz, a designer and professor of the Graduate School in the Architecture Department at the University of California, focuses on body conscious design. With her work "The Chair" from 1998 she fights the classical idea of stationary sitting which in her argument is unhealthy and preventing a productive body physio.

She collected evidence that reaches from the human as an active being as base issue for sitting still (Cranz, 1998, p.95) to specific problems caused by the classical upright sitting posture. Hindered blood flow is to be the reason for a decreased oxygen supply to the head which results in a person becoming tired more quickly while seated (Cranz, 1998, p.100).

Another example the Lego Foundation has published the review: "The role of play in children`s development: a review of the evidence" in 2017. A paper that collects and

evaluates the known studies on different kinds of children's play and their impact on their benefit to learning behaviour.

The for me most relevant part for me, the physical play chapter, concludes as followed:

“there is evidence that unstructured breaks from cognitive tasks improve learning and attention, though it is unclear whether physical play contributes to this effect beyond simply taking a break and, for example, talking with friends.” (Whitebread, et. Al. 2017)

What this conclusion states is basically what we all did at school; take periodical breaks from school tasks where we are free to do what we want. The modern school system usually schedules these breaks every 60-90 minutes for 15-20 minutes.

These breaks might fulfil the needs for most of the children at school but not for everyone. For me and many others during class in children's or teenage years it was hard to concentrate. For some it was harder for some it was easier. Some had a harder time during math class and others in biology. But there is few evidence to find for these, I would call them, now-and-then issues. Minor inconveniences that one should just “try harder” on, and for some this will work well enough to get decent results. Children with a attention disorder, such as ADD (attention-deficit disorder) or ADHD (attention-deficit hyperactivity disorder) need more than just cheerful words to get along in the every day school life.

Fortunately in this field there are sources that focus exactly on the issues of concentrating for people with a attention disorder and how to cope with them.

The article:” A quantitative analysis of fidgeting in ADHD and its relation to performance and sustained attention on a cognitive task”, published in 2024, conducts a large study on the connection between fidgeting and concentration with participants that have a diagnosis on ADHD (as the title explains). The study itself includes 70 participants that perform attention tasks while their fidgeting activities are monitored and later evaluated. The article concludes as followed:” [...]. *This observation supports the theory that fidgeting aids arousal and improves sustained attention.*” (Son, et. Al., 2024, p.1)

This concept in applied form can be seen in objects or furniture that give users, that suffer from a attention disorder, the opportunity to fidget while in a learning

environment.

The “**Kinnebar Footswing**” (Whalen, 2020) is one of these products. The foot-swing is a fidgeting device mainly for children with ADHD that is supposed to aid their concentration by giving them the option to move their feet. They can use either a swinging bar or a rubber band to move their lower legs. Both devices are attached to a wooden frame that can be placed and secured under a table (see figure 1). While the user fidgets with this device the upper body can stay still to perform regular classroom related tasks such as reading or writing.

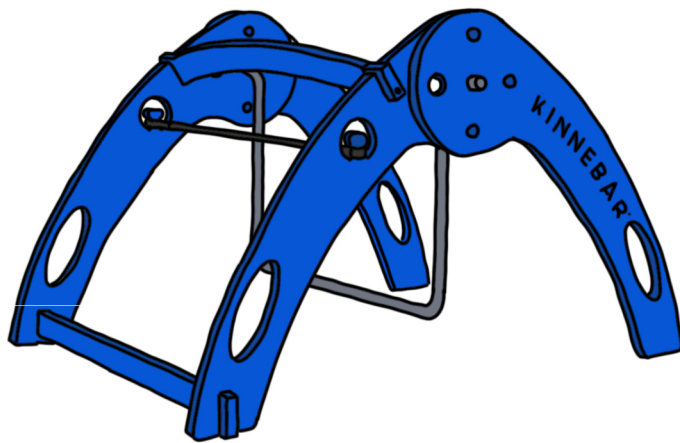


Figure 1

Kinnebar Footswing, (Whalen, 2024)

the device in action as well as the effect on the child’s learning behaviour. Other videos and texts on the website address the so called “sensory input” as a crucial aspect of aiding concentration for children with ADHD. Sensory input defines every input a healthy human can perceive with their senses meaning touch, smell, taste, feel, and so on.

Lastly and most interesting for me they also link literature for the customer to read up in case the product has not yet convinced them.

Among them I found the article:” *Helping Students with ADHD in the Classroom*”. It was published in the “CHADD” magazine, a Publisher based in the USA that focuses on attention disorders such as ADHD in the year 2017. It was written by Sydney S. Zentall, PhD, a professor of educational studies at Purdue University USA.

The article gives hands on information on how to deal with students with ADHD in the classroom (as the title claims), for example:” *Movement options often help students focus better.*” and later suggests to hand out things to play with like a pipe cleaner. (Zentall, 2017, p.1). A clear indication towards fidgeting as a tool to aid concentration

To promote this article the website provides different media on how children use this tool to learn state that:“ it can definitely help” (Whalen, 2020) children with their learning tasks.

A video, visible on the website, compares two leaning situations with one child, once with,- and once without the Kinnebar product, for the customer to see

in the classroom. Beside this article Zentall has published other peer reviewed articles in the same field.

Another furniture collection that revolves around the children`s learning environment is the product pallet of “**Kore Design**”. Their products are based on the design of Jon Elmaleh in the year 1970 (Elmaleh, 1970), which was then further developed for children of any age and later for adults to work in an office environment.



Figure 2,
Kore Kids Junior Wobble Chair, (Elmaleh, 2016)
Copyright ©, Eco Harmony Products Inc.

The philosophy behind it differs from “Kinnebar” for that they focus more on the ability to move while sitting and hence state on their website: ”encouraging the body to move, which will help strengthen one’s core muscles (lower back and stomach) with daily use.”(Kore, 2024).

However they also address the benefits of this products sensory input for children with ADD or ADHD. The ability to move freely on your sitting furniture seems to be a sufficient tool to get rid of unused energy.

“Provides an outlet for high-energy children & sensory seating for ADD, ADHD or Autism.” and “Active-sitting reduces stress”(Kore, 2024) are statements they claim on their website. Sadly I could not find a source they base this on.

Image 2 depicts the `Wobble chair`, a simple stool made from plastic (HDPE) with the ability to safely rock in every direction.



Figure 3, Variable Balans, (Variable, 2024)
Copyright ©, Design: Peter Opsvik, Photo: Peter Opsvik AS

Looking further into the field of movable furniture several products from Peter Opsvik come across. Opsvik is a Norwegian designer who was active from the 1970s until the 2010s. He designed several sitting furniture that were able to move. The **Variable Balance** (figure 3) was one of them, a stool one kneels on with the ability to rock fore and back

while sitting in an upright position that allows to work on a table simultaneously.

Opsvik was convinced that for healthy sitting the variation of postures was the key. He claims: *"I believe there are a number of good sitting postures and the importance of a chair is to make it easy for the user to change between them."* (Opsvik, 2024).

While sitting on this furniture I got the feeling that this is not a furniture to sit in for a long time. The shins experience uncommon pressure against the designated pads and start to tingle after a sort amount of time as the blood circulation is hindered. However his argument in "Rethinking Sitting" is, that the wider angle between torso and thighs increase blood flow. (Opsvik, 2009, p.49-51)

When it comes to the visual communication on how to sit in this furniture I personally did not understand how to use it, since it is an uncommon sitting posture.

The movement however is unmistakably conveyed through the form.

Other furniture have a similar approach to movement in a learning,- sometimes also office environments. The Swopper Stool designed by Hennes Jahns, the Muista Chair by Aurimas Lažinskas and the Tip Toe by Barber et. Al. (see figure 4, 5 & 6) pursue a similar goal like Opsvik did. They try to implement a physically healthy seating. To achieve this one has to either balance on the furniture or one is able to change between many seating positions. Although it is not the primary use these furniture are made for they are suitable fidgeting tools.



Figure 4,
Muista Chair, (Muista, 2022)
Copyright ©, MB Muista



Figure 5,
Swopper, (Jahns, 2024)
Copyright ©, Aeris GmbH



Figure 6,
Tip Ton, (Barber, 2024)
Copyright ©, Vitra International AG

Talking about the visual communication leads me to another object designed by Opsvik which he named “**Python**”. Python is a stool made from a single piece of round pipe, shaped like a spring, with a ball attached to the top and a net spun in the centre that serves as a seat. (figure 4)

Although I have not had the opportunity to try this furniture it speaks, or better to say, it screams out its usage. And that is “bounce on me”. Opsvik himself describes it as the following:

“This chair is more a symbol of movement and flexibility than it is an incarnation of these criteria. A coil spring is a symbol of softness and resilience.”(Opsvik, 2024)

It can be helpful for the user if they can understand the objects usage on sight with no further explanation necessary. In the case of children`s furniture it becomes more important for the furniture to send strong and clear signals on how it can be used. A manual should not be necessary as well as an introduction course.

3.3 Review Conclusion

The chosen sources frame my own intentions and the features my results should have. My Project should aim at furniture used in a school or learning environment and hence allow study activities, such as reading and writing, while using them.

The main focus lies on furniture that allows movement while sitting, but my work should not be limited to this. I also see myself addressing the sensory input as a feature to implement in my work, sometimes both are the same. The intended purpose is, similar to that of Kinnebar foot-swings; To aid children`s concentration. However this is something very individual and difficult to measure so I will limit my goal to **offering the ability to move or fidget while sitting and learning.**

Lastly the furniture should be able to communicate its usage to children or inexperienced users. Like the Python stool does, I want to inform the user about the function within the form language of my results.

Out of this, I derive the following qualities or properties, that my result should possess.



Figure 7, Python, (Opsvik, 2024)
Copyright ©, Design: Peter Opsvik
Photo: Peter Opsvik AS

Movement or Fidget:

What kind of activity should my result be able to be used for ? Is a simple rocking enough or should it have some sort of texture lied into a surface to trigger as many senses as possible? I will start by aiming for one activity, such as movement, and offer as many varieties of this action as possible so that many different users can perform their individual favourite activity.

Sit and Learn:

Since I am concerning the learning environment, the user has to be able to, well..., learn. For that my main focus will lay on an upright sitting posture to perform actions like reading or writing on a table. However I will not limit myself to this knowing that learning can be done in other positions just as good.

Visual communication:

The result should speak of its use and the activities that can be performed with it. This should be clearly and easy understandable. No introduction should be necessary.

Safe to use:

The result should be safe to use. This reaches from a possible movement that should be safe to perform, to the materials, surface treatments, and other chemical hazards. Designs for children are usually the strictest regulated by government.

Silent/ no distraction for others:

The result should aid concentration and not seed distraction. If one individual is helped while everyone else in the classroom gets distracted no one has won. Since I design for a learning environment that is often performed in a group such as in a classroom environment, I need to take care that the result has minimal negative impact on other learning individuals.

4. Proposal

4.1 Project Aim

The goal of this project is to make a series of results made from wood that portray strategies to implement movement or fidgeting into furniture.

4.2 Approach

To achieve my goal the following will outline steps I will take to reach it

Research:

Find and analyse potential sources regarding their function (both visual and practical) for aiding children`s concentration in a learning environment. The sources will be discussed in part 3.2: discussion of sources. They consist of objects / furniture that have a similar function and articles that address the topic I focus on.

Analyse:

Out of the gained information from my research I will define the qualities that I want my results to have (see part 3.3, review conclusion). They will outline my projects intention so that I can narrow down what my result should be. In this step I will furthermore rate the importance of each `quality` for the case of mutual exclusivity.

Model making:

The collected qualities will inform a series of models I will make that display different concepts on how to give the user the ability to fidget in a learning environment.

Evaluate and advance:

This step can cycle more than once depending on the success I make in each revolution.

I will critically evaluate the models I made regarding my defined qualities. The best ones make it to be advanced and refined, the others will be sorted out (potentially to be picked up again).

Test:

As soon as one model has made it to the `one-to-one-model-stage` I will test it by using it first for myself and later find other test users that fit my target group to test my results.

Fine adjustments:

These Tests will be followed by another "evaluate and advance" unit, this time more focused on functional details and visual communication to the user.

Later steps:

Knowing that my time is limited I will focus on the steps above. However the following points are something I want to list to complete the “schlacht plan” I am making.

Production optimisation:

After the piece is functioning as intended it needs to be prepared for production. This can mean to make changes in raw materials, connection methods, or production method without altering the quality of the function.

Marketing:

Find companies to cooperate with for a distribution platform / channel and production. Also find a separate channel of advertising the product if necessary.

4.3 Timetable and resources

Week	Date	Phase	Activity	Events
36	02.09.-08.09.		Start up week	
37	09.09.-15.09.	Research	Research	
38	16.09.-22.09.			
39	23.09.-29.09.		Design-Talente Competition	
40	30.09.-06.10.		Research	
41	07.10.-13.10.	Workshop	Assignment 1	
42	14.10.-20.10.			
43	21.10.-27.10.	Writing	Write PP, Art. Questions & Bib. assignments	
44	28.10.-03.11.			
45	04.11.-10.11.	Examination	Presentations	
46	11.11.-17.11.	Research	Research	
47	18.11.-24.11.			
48	25.11.-01.12.			
49	02.12.-08.12.			
50	09.12.-15.12.			
51	16.12.-22.12.	Writing	PP Time	
52	23.12.-29.12.			
01	30.12.-05.01	Workshop	Model making	
02	06.01.-12.01.	Buffer week		
03	13.01.-19.01.	Examination	Presentation and Exhibition setup	
04	20.01.-26.01.	Workshop	model making (concept ideas)	
05	27.01.-02.02.			Entrepreneur Week
06	03.02.-09.02.			SFF (04.-08. FEB)
07	10.02.-16.02.			
08	17.02.-23.02.			Visit Bohuslän (21. FEB)
09	24.02.-02.03.			Testing
10	03.03.-09.03.			Fine Adjustments
11	10.03.-16.03.		Final Build	
12	17.03.-23.03.			
13	24.03.-30.03.	Writing	PP, Documentation, Reflection & Conclusion	
14	31.03.-01.04.			
15	07.04.-13.04.		Presentation	
16	14.04.-20.04.	Buffer week		
17	21.04.-27.04.	Examination	Presentation	EX (23. APR)
18	28.04.-04.05.			BA Exam Week
19	05.05.-11.05.	Exhibition	Bohuslän Exhibition	Opening Exhib. (08. May) Public Diss. DL(08. May)
20	12.05.-18.05.	Writing	Public Dissemination, Submission of compiled Thesis	
21	19.05.-25.05.			Report DL (19. May) Action Plan DL. (21. May) Present Report (23. May)
22	26.05.-01.06.	Exhibition	Konsthall Exhibition	Present Action Pl. (28. May)
23	02.06.-08.06.	Writing	Dissemination & Thesis	Thesis & Abstract (08. Jun)

4.4 Documentation Plan

My documentation will consist of a visual essay that describes each step of my design process. Telling images of my sketches, models, and prototypes as well as other necessary visual documentation for e.g. the field test I am aiming to conduct.

In addition to that I will video record workshop production steps to produce social media content for this project. I will produce short-film material that shows the function of each result I made to be shown at exhibitions.

Documentation

Introduction

Furniture to aid concentration in a learning environment. Many students, both growing up and adult aged, struggle with the standardised format of schooling. Most learning activities are non physical and purely cognitive. The intuitive response to this is fidgeting. Fidgeting is a side activity often performed subconsciously while working on a cognitive task. The fidgeting activity is usually a purely physical task that requires minimal cognitive capacity. Hence it is a repetitive task. My furniture will have built in fidgeting features.

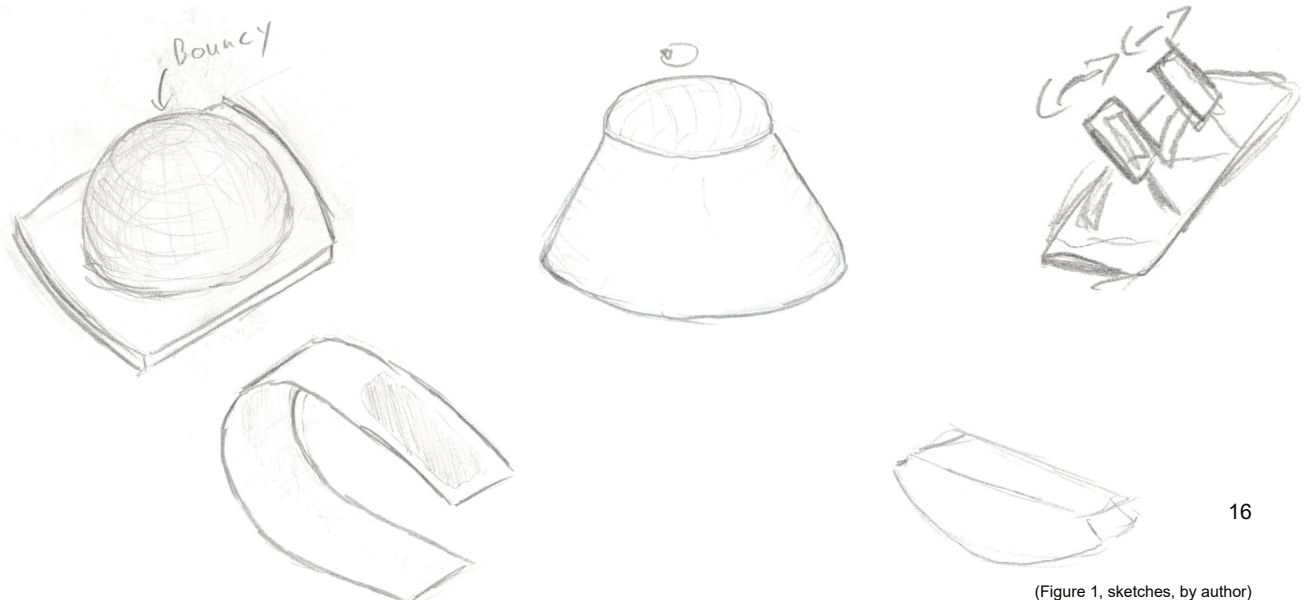
The classroom as the learning environment ads certain requirements to the furniture. It should mainly not disturb other learners while in use through e.g. sound or great movement.

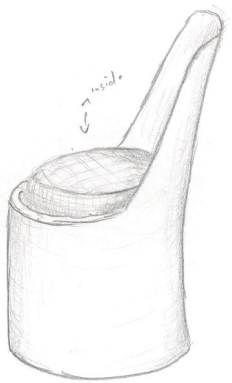
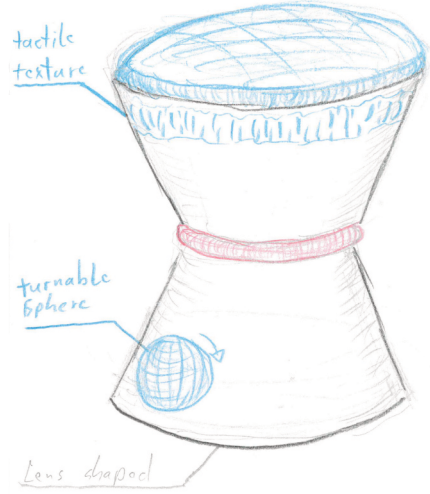
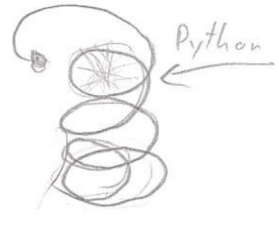
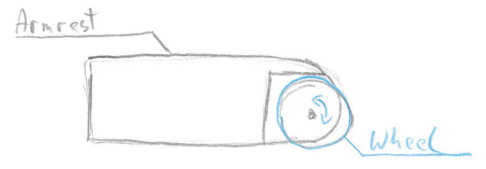
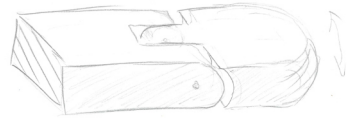
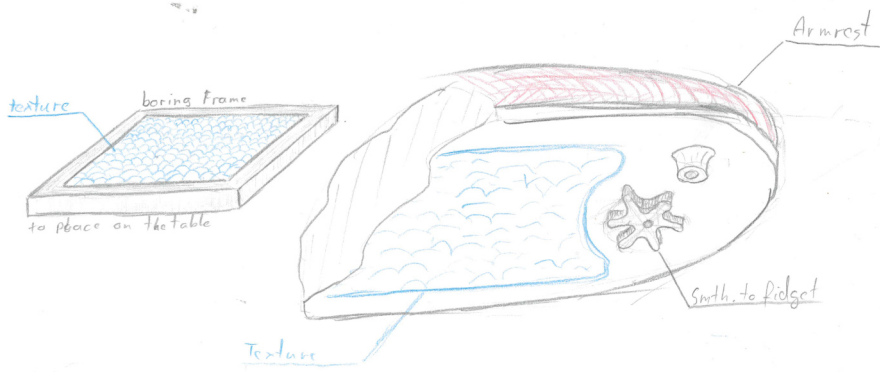
This document will contain the Path I have taken throughout the studio work for my master thesis in wood oriented furniture design. To get an overview I have added the flowchart appendix 1. Each icon represents one model which can be found in the respective image.

Concepts and sketches

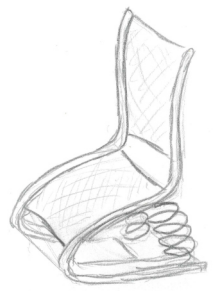
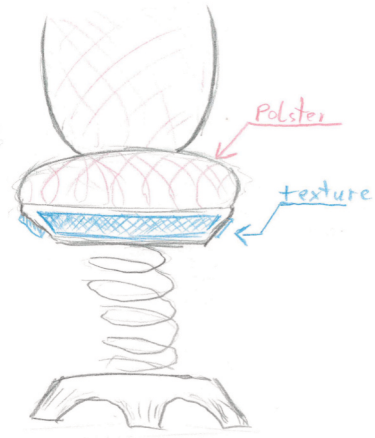
After the research work was done and I engaged into the studio work. I started to generate concept ideas to depict possible fidgeting activities that can be performed in the learning environment. I sketched concepts for different movements that are possible in the set environment; the classical classroom.

The gathered activities can be sorted into three categories: movement with the foot or leg, movement with the hand, and whole body movement.





i like



(Figure 2, sketches, by author)

Model making

Once enough viable ideas filled my sketch book I started to sort for the most promising in each category and developed them into three dimensional objects.

Each model allows a unique movement or fidgeting activity. Since humans have different preferences in fidgeting I tried to cover as many different movements.

These models were often inspired by my own fidgeting movements. I also gathered information from my fellow students as is went into discourse with about fidgeting preferences.

The time was then to focus more on the product I want to produce. The question of: "What should my end result look like" determined my decisions.



(Figure 3, foot pedal model, by author)



(Figure 4, foot swing model, by author)



(Figure 5, foot pedal model, by author)



(Figure 6, foot toy, by author)

Foot fidgeting activities

The different models can be used to perform movements with one foot placed on top of them. Some can simply give a sensory input when used.

The act of fidgeting is a wide range of activities that people do. Different people like to do different fidgeting activities. One idea that resulted from this thought was to offer a wider range of fidgeting within one object.

Model making

Once enough viable ideas filled my sketch book I started to sort for the most promising in each category and developed them into three dimensional objects.

Each model allows a unique movement or fidgeting activity. Since humans have different preferences in fidgeting I tried to cover as many different movements.

These models were often inspired by my own fidgeting

Full body solutions

As many students start rocking the chair when bored, a sitting furniture that in itself allows movement seems logical. But it has to be safe to use and non disturbing to others around the user.



(Figure 7, model stool, by author)



(Figure 8, model stool, by author)



(Figure 9, model chair, by author)

Hand fidgeting

Either positioned on the armrest or on the side of the seat. These objects offer movable features that can be played with while sitting on the furniture



(Figure 10, model finger fidget device, by author)



(Figure 11, model armrest fidget device, by author)



(Figure 12, model armrest fidget device, by author)



(Figure 10, model finger fidget device, by author)



(Figure 7, model stool, by author)



(Figure 13, bialetti stool, by author)

To combine different fidgeting activities into one furniture seemed to be the 'way to go' at this point. I created a stool that offers multiple fidgeting activities within one object (Figure 13). It is a combination of a stool with a lens shaped bottom (Figure 7) and a finger fidgeting device that incorporates a movable disc (Figure 10).

The finger fidgeting device is mounted on the side of the seating surface and can be used while sitting. The lens shaped bottom makes the furniture rockable in any direction.

While using this stool (Figure 13) in every day life I was wondering if there is a way to make a furniture that allows active and stationary sitting. A furniture that the user can decide to rock on, but also to sit still if they need to rest. A backrest would be necessary for the resting part.

In the following I tried to facilitate different zones of sitting into one chair.



(Figure 14, five sided stool, by author)

For that I started to develop an earlier project into a chair. Figure 14 shows a stool with five legs. It doesn't have a solid stand but instead five different solid positions and a pivoting point in the centre that one can freely twist and turn on. Contrary to the purely active stool (Figure 13) this one is a combination of dynamic,- and stationary sitting. One does not want to always fidget. A resting opportunity should be given.

I tried to adjust this concept to a chair (with backrest).

I reduced the amount of legs to four, so that the chair has a passive resting "zone" both in the front as well as in the back. A backrest should support the back for optional relief on the spine.

The following model (Figure 15) had these steps incorporated. However the sitting



(Figure 15, active passive chair version 1, by author)



(Figure 16, active passive chair version 2, by author)

comfort was very low and the pivoting point was inconvenient.

To counter these issues I made adjustments in certain dimensions and angles. The second prototype (Figure 16) had a much better sitting comfort and the active and passive "zones" were functioning as intended. I lowered the backrest so that it gives better lumbar support.

The test:



(Figure 17, field test, by author)

To prove the concept and to see which objects work best in the context I arranged a test with an elementary school class in the Ekhögsskolan in Dals Långed. The Students could try out all the furniture I made so far and I could observe and analyse the behaviour on each of them as well as the functionality of my prototypes.

The 'Bialetti stool' (Figure 13) was too active for the planned usage. It was more a toy than a sitting furniture. The children used it as a spinning top instead to occasionally wiggle while sitting. Furthermore the built in fidgeting wheels were not merely used as much as I hoped for. The working title for this object became "the Bialetti stool" after almost everyone in my department told me it looks like the Bialetti espresso cooker.

All of the foot fidgeting devices were only occasionally used. More out of interest than to actual fidget.

Best results had the active passive chair (Figure 16). It gave the opportunity to move and change position if wanted but it is not possible to do a full spin on this furniture. One of its legs at some point touches the ground and stops the motion. If needed the user can lean forward to perform writing activities and lean back to give ones back a little rest.

The only downside on this furniture was that the legs make a clonk sound when they hit the ground. Something that should be solvable with some padding.

Fine adjustments

The final step of my studio work will be to work out the fine adjustments for the active passive chair (Figure 16). I have decided to now focus on this result in particular. The concept of active and passive sitting zones seems to be the most adequate to the context. Students can decide at any time whether they want to move or rest. Additionally to that a forward leaned stationary position is supported by the chair.

The furniture does not give too much freedom in movement, a feature important for the younger, slightly too active audience. The user can not perform a free spin on the chair without touching the floor with one chair leg and so getting stopped.

To get this furniture developed to a finished product smaller changes have to be made. To increase sitting comfort I need to make changes in dimensions. Rocking the chair results in a clack clack sound which can be irritation for other students. My solution to that will be some sort of felt-lining under the chairs feet.

To facilitate construction, assembly and transport I will make the furniture deconstructable. Also damaged parts can then easily be replaced without scraping the whole furniture.

In his book:” Rethinking Sitting” Peter Opsvik argues that furniture for children does not need to, or even should not move. He claims that children do not need the invitation to move because they will do it on their own. Instead they need a solid object they can rely on. Grown ups on the other hand benefit from movable furniture (Opsvik, 2009, p.162). An interesting approach and probably a valid reason to adjust the age of my audience, but more about that in the reflection essay.

Last but not least I want this furniture to be usable within a school environment in

Europe it has to conform with the regulation EN 1729-1, Furniture - chairs , tables for educational usage, part 1. (see figure 18)

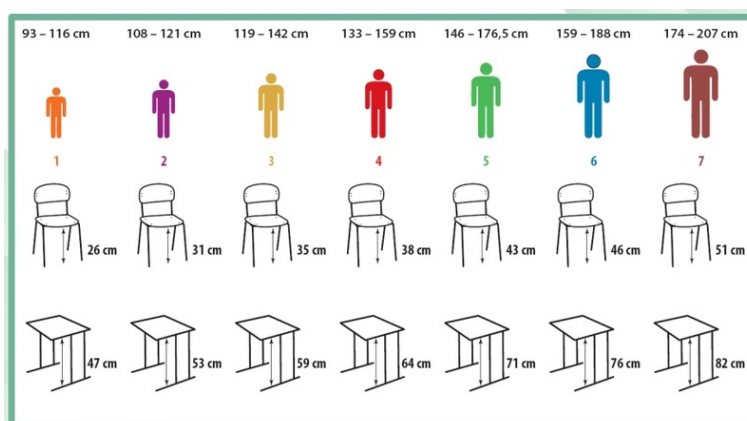


Figure 18

Different chair and table heights depending on users body size, (DIN EN 1729-1, Möbel (NHM), 2016)

What happens next?

After the furniture has become a functional and aesthetically pleasing object I can address further questions concerning:

Efficient production, how am I going to produce the different components?

Shipping, I have to design a efficient and visually fitting packaging solution.

Marketing, where and how am I going to sell it?

Dealing with these positions can result in me having to make changes in the design as it is at the moment.

Reflection and Conclusion

This essay compares and discusses the outcome of my master thesis project "Fidgeting Furniture" to the outlined frame that I have created in the project proposal of this project.

How did it turn out? / Result Description

The outcome of my project is the "Active / Passive Chair" (See figure 1). It is a chair that should be used to work at a desk. It is made from birch plywood and padding. While the usual furniture is either only active or only passive, this furniture does both. The user can at any time choose between the two. There are passive / stationary sitting zones in the front and back of the chair. This means that the user can lean back and to the front to sit still. In between these two there is a free zone where the whole chair pivots around one central point. The user can here lean in all directions for about 5° and also turn horizontally. Although these movements are possible a full spin is not possible without the support of the users feet. The furniture can be disassembled into small parts so that it can be flat packed and shipped.



Figure 1, Active / Passive Chair totale and details (by Author)

Proposal Frame

The following is an extract from my project proposal where I outline the properties my project should have,

- The result should portray strategies to implement movement or fidgeting into furniture.
- The result shall be usable in a learning environment; sitting upright at a desk while performing cognitive demanding tasks.
- The usage of the result should aid concentration and extend the users attention span. This should also apply when multiple people use the same kind of object in one room. No or only few disturbance should be caused.
- The result should speak of its use and the activities that can be performed with it. This should be clearly and easy understandable.
- The result must be safe to use in any way.

Relating the outcome to my project I would consider it a successful execution of what I aimed to do. The results show a variety of different movements one can perform while sitting. The sitting posture and usage, upright posture sitting at a desk, is given.

The following questions is a bit more complex to answer. I couldn't get a clear answer on the question whether it actually aids concentration in the given context. According to the researched literature about fidgeting as well as the words of Galen Cranz and Peter Opsvik it should have some sort of positive impact. The issue that I see here is the fact that all humans are functioning different in this case. Starting at the use of fidgeting in general there are people that are fidgeting a lot, others however don't do it at all and furthermore get irritated by their neighbour making only the slightest sound or movement. This becomes even more relevant when I imagine a full class, let's say 20-30 students, using the furniture I made. This point I need to investigate by:

1. Deeper research concerning fidgeting in a social or group context. I can also imaging individual interviews on how people use fidgeting and relate to people around using it.

2. More testing. Best would be to have a longer testing phase. I imagine a classroom that is fully equipped with my final prototype. The classroom will be used normally and after a month I will have interviews with the teaching staff around the impact it had on their lessons.

Since the final prototype is finished I had the chance to watch many people sit in it for the first time. The majority started with a careful try out phase where every possible movement was performed. I assume mainly to see whether the chair can tip in any direction. After that the sitting and fidgeting quality was tested.

The Active / Passive Chair offers a different kind of sitting comfort to the user. If a regular sedentary sitting is expected users become surprised by the inconsistency of the seating position. After a short first use phase however the usage becomes quite clear. How and if they will use the moving feature is up to the user after all.

Lastly we have to talk about safety. I can see certain areas where this could be questionable. Firstly the unknown movement. Users that are not familiar with the function can be surprised by the sudden movements it makes when sitting down. The worst case could be that the user falls off to the side. Second it the fact that the legs move up and down when used. Users that don't wear shoes or people walking behind that don't wear shoes can get their toes wedged between the chair and the ground.

Yet I am not too concerned that this is an actual risk potential, but I am aware that there are strict guidelines in public facilities that can see this as too dangerous to acquire.

Literature

The result of my project is strongly based in the literature that I reviewed in my proposal. Both the concept of fidgeting and active sitting are core elements of my final prototype. The reviewed furniture has similarities to it. Some are stronger some are less striking.

One part however I have addressed least in my outcome. I am talking about the visual communication of the usage. The overall shape, especially the rounded corners, of the lower wood construction conveys a floating and light image. This could be indication for a movable object. However the users that I could observe often got surprised by the movable nature of the furniture.

External Critique

Eva Hild:

-colour and pattern of the cushion to create an individual or personal relationship with the furniture

-The little knots underneath the seating surface are disturbing in the flow of shape

-Optimisation and producibility of the furniture

-Repeatedly referring to the result as a high price segment product

Reflecting on Eva Hilds comments I have to say that I strongly disagree with some of them. Firstly the statement that I could have made more use of playful colour and individual patterns to increase the users personal relation to the furniture. This might work when you look at my final result as a piece located in the personal office at home maybe but since I aim for a different context the question becomes obsolete. I can see myself investigating more in different colours concerning the fabric. One valid reason for me could be when the room they are used in has a specific colour scheme which requires the furniture to adapt in terms of colour.

Talking about the changes I made to facilitate disassembling the object, the small flag shaped plywood extensions that reach under the seat, I agree that they add a certain complexity to the shape and could be left out. In this case however I think that , regarding the knock-down feature, it is one valid way to solve the issue.

When it comes to producibility I have not done any hard calculations on time and cost of production since this would include getting offers from companies that can produce the parts. I would not say that the final object is a high price segment furniture. It is relatively easy to produce from sheet material and only few fabrication steps are necessary to build the furniture. Also the upholstery is not advanced but rather simple which makes it easy and quick to produce.

Torsten Hild (examiner):

-The shape of the upholstery could relate to the shape of the wood structure

I agree to this comment on the shape of the padding. It has a shape that doesn't speak too much to the construction below but it might also not need to. The cushions shape is adding to the legibility of the function. In my eyes it expresses lightness and playfulness.

Public Dissemination

To communicate my thesis project “Fidgeting Furniture” with the world I created two separate items of media. Each addresses a different audience.

Process Documentation:

I created a series of social media posts published on the platform “Instagram” that display my craft process of creation. Four short videos, about 90 seconds long, capture and display each craft step that I took to physically make my final prototype, called the “Active/Passive Chair”. The video making is adapted to the usual “Instagram Reel” format.

This media is directed to an audience that is interested in furniture design as well as the craft that lies beneath the product. It is made for potential customers that are interested in this object and those, who own it already and are interested in the process. It is supposed to extend my social media presence and represent me as an artistic and craft inspired person.

The media can be found under the following links:

<https://www.instagram.com/p/DImURZ9t4js/>

<https://www.instagram.com/p/DImWVzeteIQ/>

<https://www.instagram.com/p/DlvhQeBNXXu/>

<https://www.instagram.com/p/Dlvi9lItHe9/>

Print Media

A half fold leaflet that presents the final object, the “Active/Passive Chair”, and shortly describes the concept it is built on. It includes contact data to my person and my social media presence.

This flyer is supposed to be available wherever the chair is on display. This could be within an exhibition, a showroom, but it can also be handed out to potential customers and retailers. If interested it can be taken home and my person and my social media presence can be found. A bit like a business card for my object.



Active/Passive Chair



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What is it?

This chair is made to be used while working at your desk.

It allows movement while sitting to extend your attention span and lets you stay focused longer.

You can decide whether you want to sit still or twist, rock and fidget.



How does it work?

Movement while sitting does not only support a healthy back. It also increases blood flow. This results in a better oxygen supply to your brain and keeps your mind awake while thinking.

Fidgeting are the little movements everybody does when getting bored. It is your body's answer to a sedentary posture. It has evidently positive influence on your ability to extend your attention span while working on cognitive demanding tasks.

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6. Generative AI Disclosure Statement

Planning and executing this project I have refrained from using generative AI in any way.

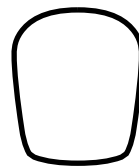
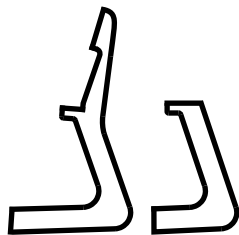
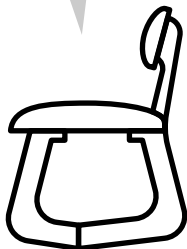
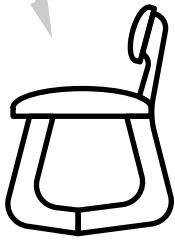
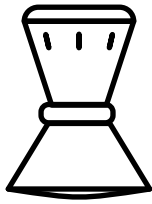
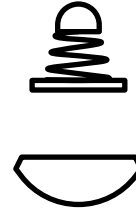
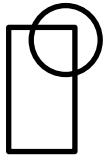
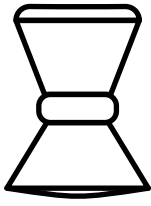
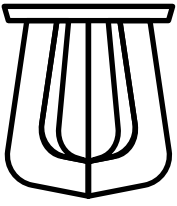
Fidgeting Furniture

Sketches

Body

Finger

Leg





June 11, 2025

Marvin Cowles
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