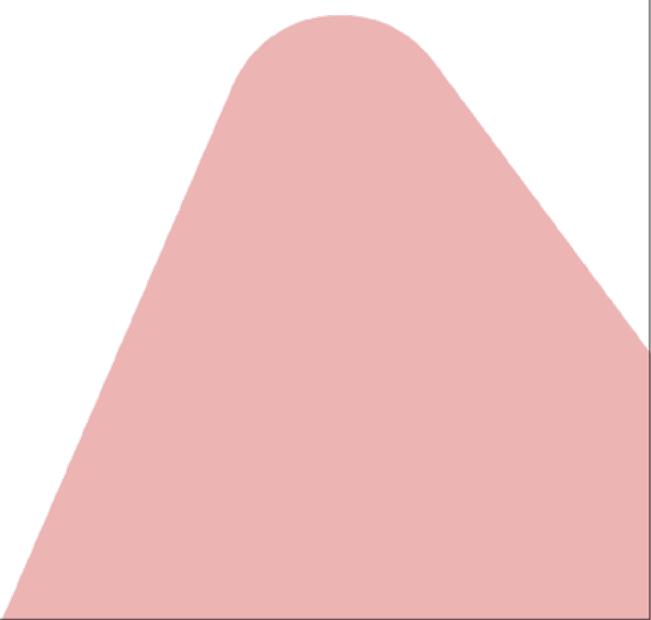
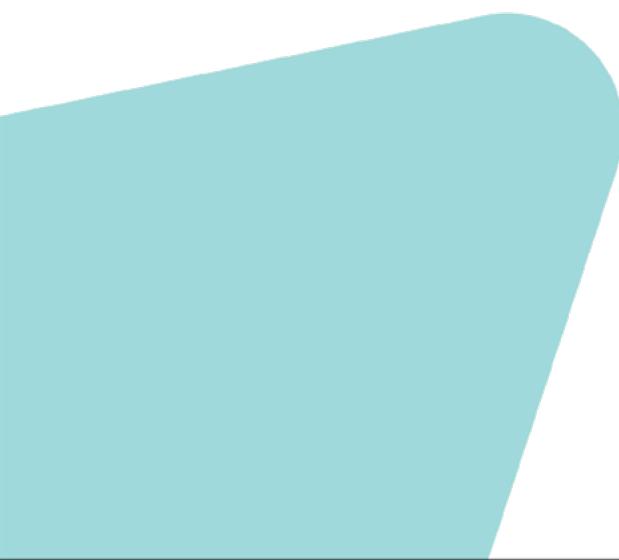


OCTAPS

◀ **Inclusive musical toy for
ADHD preschool children**

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Capstone Project 2 - Product Design
Tutor: Tulio Maximo



I want to express my special thanks of gratitude to my supervisor Tulio Maximo, who guided me and gave me many suggestions to do this project on Inclusive Musical Toy for ADHD Children.

Furthermore, I would like to thank my parents and friends who always be there and support me in finalizing this project within the limited time frame.

Executive summary

ADHD, Attention Deficit Hyperactivity Disorder, is a common neurodevelopmental condition in childhood and will last until adulthood (Centers for Disease Control and Prevention, 2020). ADHD often leads to behavioral problems at school, in family, social, and work settings, and if left untreated, the effects tend to persist in adulthood.

This project's primary target group is ADHD children(4 - 6 years old). Some of those behaviors happen to the other children and the musical instrument beginner, but the actions are less severe than ADHD.

The final design of this project is an inclusive music toy for ADHD preschool children OCTAPS at the end. OCTAPS aims to release their energy at home, explore their interest in music, support free play for children.

Content

9

Introduction

13

Research
&
Analysis

35

Insights
&
Needs Identification

51

Design Brief

55

Design
Development

89

Final Design

119

Reflection
&
Evaluation

121

Reference
&
Appendix

1. Introduction

Introduction

ADHD, Attention Deficit Hyperactivity Disorder, is a common neurodevelopmental condition in childhood and will last until adulthood (Centers for Disease Control and Prevention, 2020). According to Heep Hong Society (2020), the global ADHD population is about 5.9% to 7%, while the Hong Kong ADHD children are estimated to be 6.1%, and early adolescence is about 3.9%. The ratio of males and females diagnosed with ADHD is approximated to be 4:1 to 9:1.

There are three types of ADHD, including Predominantly Inattentive, Predominantly Hyperactive Presentation, and Combined Presentation. Some common signs and symptoms of ADHD are inattention, lack of focus, poor time management, hyper-focus, hyperactivity, or difficulty getting along with others, which vary by individual. However, according to

the Center for Disease Control and Prevention (2020), children with ADHD often have other problems, such as anxiety and depression. It is reported that the treatment for ADHD includes taking medication and having therapy, such as behavioral therapy, music therapy, while the medication is not recommended to ADHD children between 2 to 5 years old (Centers for Disease Control and Prevention, 2020).

While playing musical instruments is one of the methods of music therapy, there are many benefits of playing musical instruments for ADHD children to improve their daily performance, such as training concentration, improving time management and social skills, and enhancing mental health (Team, 2015). Nevertheless, some with ADHD may face difficulties in learning musical instruments because of those

symptoms. Some of them may not follow the music teacher's instruction; they may be attracted by something and cannot concentrate during class; they may have difficulties reading the notes. In addition, some of those behaviors happen to the other children and the musical instrument beginner, but the behaviors are less severe than ADHD's.

Therefore, this project is primarily targeted to the ADHD Children from 4 to 9 years old, which is the earliest age for children to start learning to play musical instruments; the age's primary treatment is not meditation; the age faces more trouble daily life performance. The project also may include other groups, like the normal children who have interests in music and music instrument begin-learner as well in the future.

Due to the difficulties in getting more in-depth insights from the ADHD children, the research participants will include four different groups - ADHD children parents, ADHD adults who played musical instruments, music therapists, and musical instrument instructors for ADHD children. From the face-to-face interview, the researcher would like to know more information about music therapy for ADHD children, to have a deeper understanding of the impact of music on ADHD's daily life, to understand the ADHD's learning difficulties and solution on musical instruments.

The project aims to design an inclusive instrument and service supporting music for ADHD children to improve their daily performance by making it intuitive to learn and play, modulating mood swings, and easy for organizing.

2. Research & Analysis

- 1) Literature Review**
- 2) Primary Research**

Literature Review

The literature review was conducted to gain an understanding of the topic area. It was essential to understand the background of ADHD, the impact of music on disability, musical instruments, and music therapy. This knowledge acted as a basis for the project's background and development of primary research and translation.

After looking into plenty of the related topics' articles and case study, in this literature review, it will cover the six key-related pieces of information on the topic: (1) Symptoms for 3 Types of ADHD, (2) Other Problems Come with ADHD Children, (3) Learning Difficulties, (4) Treatments for ADHD, (5) Music Therapy, (6) Types of Music Help Concentration, (7) Benefits of Playing Musical Instruments, (8) Learning Musical Instruments.

Symptoms for 3 Types of ADHD

There are three different types of ADHD which includes Predominantly Inattentive presentation, Predominantly Hyperactive Presentation and Primarily Combined Type ADHD. According to Centers for Disease Control and Prevention (2020), a person who has over six below symptoms will be diagnosed with ADHD.

1. Predominantly Inattentive presentation

Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities (e.g. overlooks, or misses detail, work inaccurate)

- Often has difficulty sustaining attention in tasks or play activities (e.g. has difficulty remaining focused during lectures, conversation, or lengthy reading)
- Often does not seem to listen when

spoken to directly (e.g. mind seems elsewhere, even in the absence of any obvious distraction)

- Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (e.g., starts tasks but quickly loses focus and is easily sidetracked)
- Often has difficulty organizing tasks and activities (e.g., difficulty managing sequential tasks; difficulty keeping materials and belongings in order; messy, disorganized work; has poor time management; fails to meet deadlines)
- Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (e.g., schoolwork or homework; for older adolescents and adults, preparing reports, completing forms, reviewing lengthy papers)
- Often loses things necessary for tasks or activities (e.g., school materials, pencils, books, tools, wallets, keys, paperwork,

eyeglasses, mobile telephones).

- Is often easily distracted by extraneous stimuli (for older adolescents and adults, may include unrelated thoughts)
- Is often forgetful in daily activities (e.g., doing chores, running errands; for older adolescents and adults, returning calls, paying bills, keeping appointments)

2. Predominantly Hyperactive Presentation

Often fidgets with or taps hands or feet or squirms in the seat.

- Often leaves seat in situations when remaining seated is expected (e.g., leaves his or her place in the classroom, in the office or other workplace, or in other situations that require remaining in place)
- Often runs about or climbs in situations where it is inappropriate. (Note: In adolescents or adults, may be limited to feeling restless.)

- Often unable to play or engage in leisure activities quietly.

- Is often “on the go,” acting as if “driven by a motor” (e.g., is unable to be or uncomfortable being still for extended time, as in restaurants, meetings; may be experienced by others as being restless or difficult to keep up with).

- Often talks excessively
- Often blurts out an answer before a question has been completed (e.g., completes people’s sentences; cannot wait for turn in conversation).

- Often has difficulty waiting his or her turn (e.g., while waiting in line).

- Often interrupts or intrudes on others (e.g., butts into conversations, games, or activities; may start using other people’s things without asking or receiving permission; for adolescents and adults, may intrude into or take over what others are doing).”

3. Primarily Combined Type ADHD

- Individuals with combined-type ADHD display a mixture of all the symptoms outlined above. A physician will diagnose patients with this Combined Type ADHD, if they meet the guidelines for Primarily Inattentive ADHD and Primarily Hyperactive-Impulsive ADHD. That is, they must exhibit 6 of the 9 symptoms identified for each sub-type.

Other Problems Come with ADHD Children

According to the Centers for Disease Control and Prevention (2020), there are 64% ADHD children often come with other mental, emotional or behavior disorders. In this number, there are 52% behavior or conduct problems, 33% anxiety, 17% depression and 14% Autism.

Learning Difficulties

Because of all those symptoms, teachers can not treat ADHD children the same as the other non-disability children. They are quickly out of focus on the class, can not follow the instructions, or act hyperactively during the course, making them not have the same learning progress as other non-disability children. Besides, there are cases reported that half ADHD children have a learning disability or related condition (Sliver, 2020).

Treatments for ADHD

The current treatments for ADHD have mainly two methods- meditation and therapy. There are many kinds of therapy, including music therapy, occupation therapy and behavior therapy (Centers for Disease Control and Prevention, 2020)

Music Therapy

Music therapy is “ A systematic process of intervention where in the therapist helps the clients to promote health, using musical experience and the relationships that develop through them as dynamic forces to changes (Geretsgger, Elefant, Mössler & Gold, 2014)” Music therapy can help people in terms of attention, emotion, cognition, behavior and communication.

In terms of the effect of music therapy, The first aspect is the modulation of attention. Music can grab attention and distracts people from stimuli that may lead to negative experiences. Music is structured and appeals strongly to the ADHD mind. Their mind craves a sense of organization and every song has a clear beginning, middle, and end making it predictable. Music activates both sides of the brain, engaging the entire brain so the

activated “muscles” can work together and even perhaps become stronger. This leads to a boost in motivation and the ability to focus.

The second way music therapy works is through modulation of emotion (Koelsch, 2009). Studies have shown that music can regulate the activity of brain regions that are involved in the initiation, generation, maintenance, termination, and modulation of emotions (Koelsch, 2009).

Music also modulates cognition (Koelsch, 2009). Music is related to memory processes (including the encoding, storage, and decoding of musical information and events related to musical experiences) (Koelsch, 2009). It is also involved in the analysis of musical syntax and musical meaning (Koelsch, 2009). Music therapy also works through modulating behavior (Koelsch, 2009).

Music evokes and conditions behaviors such as the movement patterns involved in walking, speaking and grasping (Koelsch, 2009). Music also affects communication (Koelsch, 2009). In fact, music is a means of communication (Koelsch, 2009). Therefore, music can play a significant role in relationships, as alluded to in the definition of music therapy (Koelsch, 2009). Playing instruments can collaborate and work with others to create new music. Often people develop strong friendships. After all, any neurological condition can be isolating for ADHD.

Here are some examples of the methods conducted in music therapy:

- Drumming
- Listening to live or recorded music
- Playing instruments, such as hand percussion
- Improvising music on instruments of

voice

- Learning to play an instrument, such as piano or guitar
- Creating art with music
- Dancing or moving to live or recorded music

Types of Music Help Concentration

There are some types of music suggested for supporting ADHD ‘s concentration when they are doing other tasks, which are classical music, white noise and music with the same binaural beats (ADHD Music: How Music May (Or May Not) Help You Focus, 2020).

There are types of music not suggested for supporting ADHD ‘s concentration when they are doing other tasks, includes music without clear rhythm music that’s loud or heavy, songs really like or hate

and songs with lyrics (ADHD Music: How Music May (Or May Not) Help You Focus, 2020).

Benefits of Playing Musical Instruments

There are many benefits of playing musical instruments for ADHD children to improve their daily performance in terms of three aspects - physical, mental and social.

In terms of physical, the players can have deep breathing if they play wind instruments. They can exercise and maintain their posture when playing the musical instruments. In addition, they can practice the coordination between fingers, hands and feet in a rhythmic manner. In terms of mental, playing musical instruments can allow performers to improve their mental performance,

release their stress. It also can let the players have a method for self-expression and get a sense of achievements. In terms of social, playing instruments with other can improve their social and co-operation skills.

Except for the above advantages, playing musical instruments also can train the learner to improve other skills, such as time management, reading skills, listening skills and concentration, which are benefit for ADHD.

Learning Musical Instruments

The earliest suggested time for children to learn a musical instrument is about four to nine years ago. Some of the music-beginner face problems include finding the traditional fundamental exercise boring, reading notes, and can not insist

on playing musical instruments.

Six Process Involved in Playing a Musical Instrument.

1. Visual: Playing in an ensemble requires to follow the conductor. Music is also a literate language, and most of us are reading the piece as we are playing (Reed, 2020).
2. Aural: When playing in a group, a musician must be listening to themselves and listening to those around them (Reed, 2020).
3. Tactile: Playing an instrument requires hand and finger manipulation in addition to hand/ eye (Reed, 2020).
4. Physical: Playing music is a physical activity, much like athletics. Success comes from building muscle memory over time through repetition. In addition to muscle memory, playing an instrument

builds actual muscle as well (Reed, 2020).

5. Translation: Playing a musical instrument can transfer the visual symbols(note) to performance

6. Creativity: Playing a musical instrument can stimulate creativity (Reed, 2020).

Primary Research

Although the literature reviews show ADHD's learning difficulties in the study, the benefit of ADHD learning musical instruments, and some of the learning difficulties faced by non-disability, few studies are about the ADHD learning difficulties on musical instruments.

Since it is easy for us to study a new thing in children's way, and ADHD children have more problems in their daily life, the research will focus on the learning difficulties for the ADHD children on musical instruments. As the earliest age for children to study the musical instruments is four to nine years old and the mediation is not recommended for ADHD children from two to five, they rely more on therapy. The research will be targeted at the age group four to nine years old.

The research method was face-to-face interviews. The research interviewees will include the people around the ADHD children considering the difficulties of interviewing ADHD children, including ADHD children's parents and musical instruments instructor for ADHD children. Since playing musical instruments is also a part of music therapy, the research also would interview music therapists. Besides, to know more information about ADHD learning musical instruments, ADHD adults who played musical instruments were also considered interviewees.

Goals

- 1) To know more information about music therapy for ADHD children
- 2) To have a deeper understanding of the impact of music on ADHD's daily life
- 3) To understand ADHD's learning difficulties and solution on musical instruments.

Methods

Face-to-face Interview

Interview Questions

The interview questions mainly includes three sections which are Music Therapy, Music in Daily Life, Learning Musical Instruments. The full version of interview questions can be found in Appendix 2.

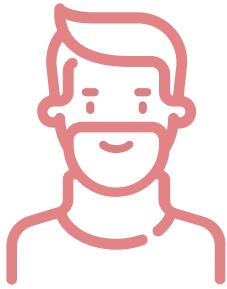
Target Interviewees

- 1) ADHD Children's Parents
- 2) ADHD Adults who have played musical instruments
- 3) Music Therapists
- 4) Musical Instrument Instructors for ADHD

Results

An ADHD children's father, two ADHD adults who have played musical instruments, a music therapist and a musical instrument instructor for ADHD were interviewed.

Interviewee 1



Background

A father having a 5-year-old ADHD son with predominantly hyperactive presentation

“Don’t put your children learning instrument earlier on, you don’t have to ask them to learn piano, violin, guitar when they are between six years old, but expose them to the instrument.”

Findings

About Music Therapy

- Instead of music therapy, the child had tried a private music class when he was about two years old.
- The music class the child attended was a general music class, which did not have any specific activity or include any specific instrument.
- The father does not think the music class supports the child any daily performance’s improvement as the teacher could not engage the child long enough in any activity. Besides, the teacher did not plan the teaching section based on his child’s interest but use the methodology to force the child.
- The father can see the child’s daily performances’ improvement when attending art or other different classes as the teachers can change the teaching activities based on his child’s situation.

About Learning Musical Instruments

- The father mentioned that instead of forcing the child to learn a musical instrument, he let his child explore different instruments by himself. Thus, the child does not play any instrument formally.
- The father also had attended a music concert for the child. The concertmaster said, “Don’t put your children learning instrument earlier on, you don’t have to ask them to learn piano, violin, guitar when they are between six years old, but expose them to the instrument.”
- Although the child does not play instruments formally, the father mentioned that the child is good at playing percussion.
- The father mentioned that the child even creates the drum by himself by using the products at home, like the sofa, pants.

Interviewee 2



Background

A 21-year-old male ADHD adult with predominantly inattentive presentation who has played the piano for over 10 years and got AMRSM grade 8 certification

‘I know it’s a bit self-contradiction, but I think playing the piano can release my stress even when I am doing sight-reading’

Findings

About Learning Musical Instruments

- He started learning to play a musical instrument when he was from two in primary school.
- After he finished ABRSM grade 8, he did not attend the piano lessons but started self-learning.
- The reason he started playing the piano because he saw his cousin play the piano and started having an interest in learning the piano.
- He plays the piano around once to three times a week and practices around 30 minutes to 1 hour each time for his interest.
- He mentioned that he is not good at sight-reading, but he is not sure if it is because of ADD since he doesn’t have any trouble reading. In order to pass the ABRSM’s task, he said that he practiced more on-site reading step-by-step.
- When he is doing self-learning now,

sometimes, some parts of the songs are hard to play, then he will listen more to the songs and imitate it.

- He thinks listening to the songs/ how other perform that you are going to perform is very helpful on the musical instrument’s performance

About Music In Daily Life

- He likes listening to classical music and pop music.
- He listens to more classical music as he thinks classical music is “multi-manner,” which means that he can listen to the music for many situations, for example, when he feels stressed when the weather is good. The songs match the environment.
- He thinks playing classical music is also a way to release stress, although it is very stressful when doing sight reading.
- He thinks music is a tool as a “mood-enhancer” and “stress release” in his life.

Interviewee 3



Background

A 38-year-old male ADHD adult with predominantly Inattentive presentation who has tried to play many different musical instruments

'As an ADHD, it is very easy for us to play musical instruments or to learn by ourselves, but it is very hard to learn in nicely or even harder to do the traditional exercises for dominating an instrument.'

Findings

About Learning Musical Instruments

- He had tried to play many different kinds of musical instruments, including plastic clarinet, guitar, trumpet, piano, except for fluent.
- Although he played many instruments, he is not skillful at all of them; the most skillful instruments he can play will be guitar and trumpet
- He started playing the plastic clarinet initially, but he does not like it because his parents force him to do it. He started playing the guitars at 14. However, it is hard to count how many years he played the musical instrument since he keeps jumping in and out of the progress.
- He said that keeping practicing regularly is hard for him. He knows that he needs at least twice a week to do a simple exercise. Although he wants to practice playing musical instruments, he

does not have enough time for it.

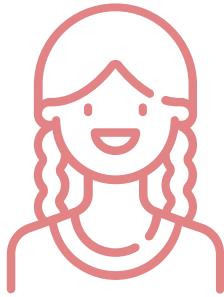
- One of the difficulties of playing a musical instrument is that he cannot concentrate on practicing for a long time. Usually, he will practice for 20 mins and take a break.
- Based on his experience, he thinks that being a band and cooperating with others is the faster way for him to learn a new song.
- Compared to scale instruments, like piano, trumpet requires more memories to play it, such as the fingering.
- In order to play the trumpet, he tried to use mouth and muscle memory and mark the fingering and melody in his way remember
- Instead of relying on reading the notes to perform, he relies on more memory from hearing to perform.

About Music In Daily Life

- He likes many different types of music.

- He thinks that music and sounds can help him to focus.
- He also thinks the white noise, songs without lyrics, meditation can help him concentrate and releases anxiety, as he has much anxiety.
- He does not like the music that is of bad quality
- He can listen to music all day.
- He would like to listen to energetic music or electronic music in the brainstorming section; he would like classical music or meditation music when studying.
- He thinks the garage bands' interface is excellent and easy to use and includes various musical instruments but can include more scales for the iPad version. However, he would prefer to listen to the radio when going back home after finishing his work as it will not remind him about the things on the work.

Interviewee 4



Background

a music therapist who has been doing music therapy for over 10 years. The main ADHD children clients are from kindergarten to early primary school.

'Music therapy is not education, there is no syllabus, we help the clients based on their needs and interests.'
'Clients' preference matters.'

Findings

About Music Therapy

- Music therapy is about the interaction between music and the clients

Music therapy usually will be conducted once a week for one client.

- The activities conducted in music therapy is mainly in 4 elements: receptive (about listening), recreative (about playing musical instruments and singing), improvisation, creative

- Music therapist will design a suitable plan for the clients based on their situation based on their performance

- She mentioned that music therapy is not one fit all.'

- ADHD children cannot sit there for a long time.

- Base on her experience, the children who have been engaging in music therapy can concentrate on one thing longer than before

- Usually, children's music therapy will not last more than one hour, once a week.

- The effectiveness of music therapy depends on each child's situation and is a long-term activity

- The music therapist also will change the plan based on the child's changes, maybe add more challenge, hope can see more improvement in the child

About Musical Instruments in Music Therapy

- Music therapist will use the musical instruments depending on the client's interests and reaction. For example, if the client likes to drum, the therapist will use the drum as the main instruments in music therapy

About Learning Musical Instruments

- The lessons are about teaching musical instruments based on the clients' situation for interest instead of getting a certification. For some SEN students,

not following any syllabus of "Adaptive Lessons" is different from music therapy, as music therapy has goals, adaptive lessons don't. The only aim of adaptive lessons is to help the clients enjoy and be able to play musical instruments."

- Generally speaking, to common difficulties for ADHD children learning musical instruments is concentration play are really quickly losing their focus. However, learning instruments require lots of concertation and practice, which is very difficult for ADHD.

- Using highlight pan to highlight some notes to help them follow the notes, pointing notes is one way to help ADHD children.

- For ADHD children, there will be a few breaks during the lesson to let the children relax, maybe one break after having 15 minutes of lessons. She said sensory would also affect the concentration, so she will let the children jump or sit on

some ball to do some physical activity during the break.

- But all the methodology depends on what the needs of the clients

- She mentioned that she heard a case that one of the ADHD children would feel headache when concentrating too much or can see the notes jump everywhere.

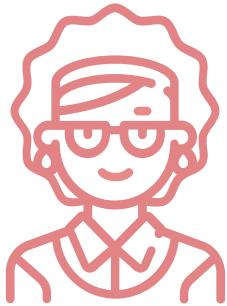
- Overall, ADHD children need to find the right person to help them

- Learning instruments can help a person, coordination, and concertation in overall speaking, so if ADHD children learn musical instruments will get lots of benefits.

Other Remarks

- She thinks taking medicine is needed for ADHD children to concentrate but also depends on the situation to decide how much.."If the children can not concentrate in any minutes, no matter how I help them, it will be in vain."

Interviewee 5



Interviewee Background

A 21-year-old male ADHD adult with predominantly Inattentive presentation who has played the piano for over 10 years and got AMRSM grade 8 certification

'I know it's a bit self-contradiction, but I think playing the piano can releases my stress even when I am doing sight-reading'

Findings

About Playing Musical Instruments

- The problem ADHD children faced when learning to play the musical instrument faced:
 - Some ADHD children cannot follow the teacher's instructions
 - Some of them cannot hear the teacher's verbal instruction as they may think something else
 - The way that that the teacher helps them to overcome the challenges
 - The first thing to do is to understand what the children's learning behavior, understand the needs. Then the teacher will make a teaching plan based on the children's situation
 - For example, if the children have trouble listening, they use some visual elements to communicate with the child, which may prepare some pictures to show the instructions.

- Sometimes, she may prepare a second clock on the class and tell the children how many seconds that he or she should stay
- The teacher mentioned that the class would not have any break as the children come for learning playing the musical instruments, and each class lasts for 1 hour, but the teacher will provide many different and short teaching tasks during the lessons.
- In order to let the children focus on the class, she mentioned that she adopted different ways to attract the children to focus on the class by using the other five sense, showing YouTube Video, holding the children's hand to play the drum, Instead of showing sheet music, maybe show the letter (CDEFGAB) or colors, using something that children are interested in attracting them to finish the task
- The drum is easier than piano as everyone get a sense of achievement while playing the piano needs more requirements
- Music can help the children concentrations
- Some Solution for cannot read notes: Different notation system, Highlight the notes enhance their concentration, Play Youtube video: play the musical instruments like a game.

Findings Conclusion

Music therapy

- Music therapy is a long-term activity.
- The improvement of music therapy is varying by individual.
- Music therapy activities conducted in the clients' situation, which also means that it varies individually.
- Music therapy is just a method for clients to promote health; clients should find suitable methods based on their situation.
- If the clients have serious problems, no matter what methodology is used, it will be helpless.

Music in Daily Life

- The types of music that can enhance concentration is the same as the literature review.
- Both ADHD adult interviewees will listen to different types of music based on different situations.
- Both ADHD adult interviewees easily get anxious and think music can release their anxiety.
- Both the music therapist and the instructors mentioned that most of the children like music.
- Interest is the best motivation to learn things. According to the ADHD child's father, his son learns to read because of music.

Playing Musical Instruments

- The typical difficulties of learning to play musical instruments for ADHD children, including, cannot focus on the class, cannot follow the class's instructions, and cannot

follow the notes, hearing problem.

- Some of the methods to release the difficulties include highlighting the notes, using different notation systems, using some visual elements for instructions, taking breaks, and doing some exercise during the lessons, using something that the children like to maintain their concentration. Overall, whatever method is used in the class is all based on the children's situation.
- Percussion is easier than scale instruments; scale instruments are more accessible than wind instruments.
- When ADHD people learn to play new songs, instead of memorizing it by reading notes, they rely more on memorizing by listening.
- It may be hard for ADHD to play the basics of traditional exercise for practicing musical instruments as they want to learn to play a new song in a day, leading to problems that they may learn to play an instrument quickly, but not skillfully.

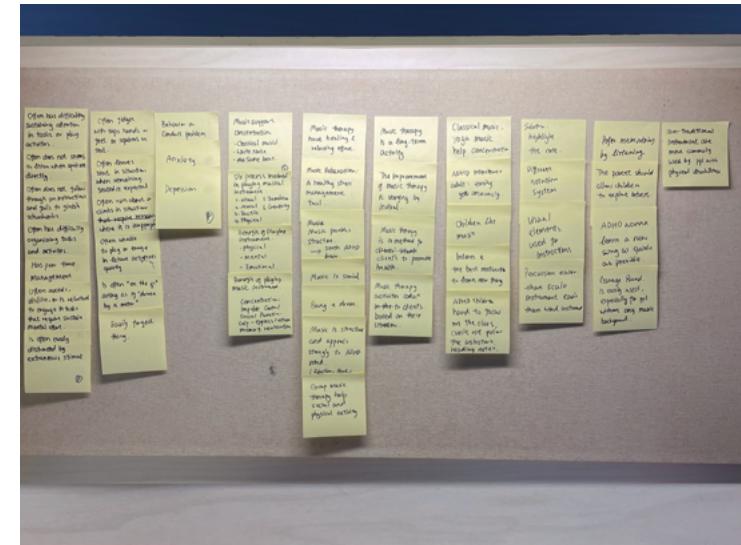
Others

- The parent should not force children to learn an instrument but allowing them to explore their interests matters.
- Garage Band is easily used, especially for people without any music background.
- Non-traditional instruments are more commonly used by people with physical disabilities.

3. Insights & Needs Identification

- 1) Translation: Synthesis & Insights**
- 2) Project Requirement**
- 3) Market Research**

Translation: Synthesis Process & Insights



After conducting the literature review and primary research, there should be a step to transfer all the findings into project requirements. In this section, it will show the synthesis process and the problems for the research.

Synthesis Process

The picture on the right shows the synthesis process. The above image displays the post-notes of the key findings from the literature review and primary research. The below image presents the post-notes after reorganization into nine categories: (1) Depression & Anxiety, (2) Hyperactive, (3) Problem's on learning music instrument, (4) Organization, (5) Music and Interests, (6) Social, (7) Music therapy, (8) Elements and Benefit of Musical Instruments, (9) Others.



Insights

Based on the synthesis process's results, below are the problems finding from the research.

Learning Difficulties on Music Instrument

ADHD children are hard to pay full attention on the class or follow instructions because:

- Is often “on the go” acting as if “driven by a motor”
- Often does not seem to listen when spoken directly
- Often has difficulty sustaining attention in tasks or play activities
- Often does not follow things on instructions and fails to finish schoolwork
- Is often easily distracted by extraneous stimuli
- ADHD children hard to follow on the class (Can't not follow the instructors reading notes)
- ADHD want to learn a new song as quick as possible

Depression & Anxiety

ADHD also come with mood issues, such as get anxiety/ depression easily, or mood swing.

Hyperactivity

Some of the ADHD will act hyperactively during the classes, with the following behaviors.

- Often fidget with taps hands or feet or squirms in seat

- Often run about or climbs in an inappropriate situation
- Often leave the seat in the situation when remaining not to do so.
- Often unable to play or engage in leisure activities quietly

Organization

- ADHD have poor time management
- ADHD easily forget things
- ADHD often has difficulty organizing tasks and activities

Music Therapy

Music therapy is a long-term activity and varies by the individual. However, Music therapy usually will be conducted once a week, which is limited to some extent. Thus, there will be a way to grow the effect of music therapy at home by the individual.

Social

Some of the hyperactive presentation ADHD children have problems getting along with others.

Project Requirements

The project's requirements are framed based on the problems and the research findings. There will be two guidelines and the five essentials for the projects.

The two guidelines include (1) Music Therapy, (2) the Six Process Involved Playing Musical Instruments. Although the effect and the treatment of music therapy varies by the individual, it is a long-term activity and the therapy is only conducted once a week. It is still worthy for the project to bring a similar effect of music therapy, extending the impact of music therapy and bringing it to more people. Thus, the project will use some elements of music therapy as project guidelines. Besides, the process element of playing a musical instrument founded in the literature review is worthy of referencing for designing musical instruments.

In terms of the requirements, five main

areas were selected based on the five problems, including learning, playing, depression and anxiety, hyperactivity, organization.

Guidelines

Music Therapy

1. The musical instrument must bring the same effect to the users as music therapy
 - a) The musical instrument should allow ADHD to express themselves by playing it.
 - b) The musical instrument should grab ADHD's attention and distract them from stimuli that may lead to negative experiences
 - c) The musical instrument should modulate ADHD's emotions.
 - d) The musical instrument should evoke and condition behaviors such as the movement patterns involved in walking, speaking and grasping.

Processes Involved in Playing Musical Instruments

1. Visual: Playing the musical instrument should enhance reading skills
2. Aural: The player should listen to the sound when playing in.
3. Tactile: Playing an instrument should require hand and finger manipulation in addition to hand/ eye
4. Physical: Playing a musical instrument should increase physical activity.
5. Translation: Playing a musical instrument should transfer the visual symbols(note) to performance
6. Creativity: Playing a musical instrument should stimulate creativity

Requiriements

Learning

1. The musical instrument must be easy to learn.
 - a) There must be instructions teaching the user how to play the instruments step by step.
 - b) Each task of the instruction must be easy to follow and short.
 - c) The instructions must keep ADHD attention on learning the instrument.
 - d) ADHD children without any musical background should learn how to play the musical instrument quickly.

Playing

1. The musical instrument must be played intuitively
 - a) The keys of the musical instrument must be easy to remember.
 - b) The way to control the volume of the sound must be intuitive.
 - c) The way to change the pitch of the sound must be intuitive.
 - d) There should be signals for notifying

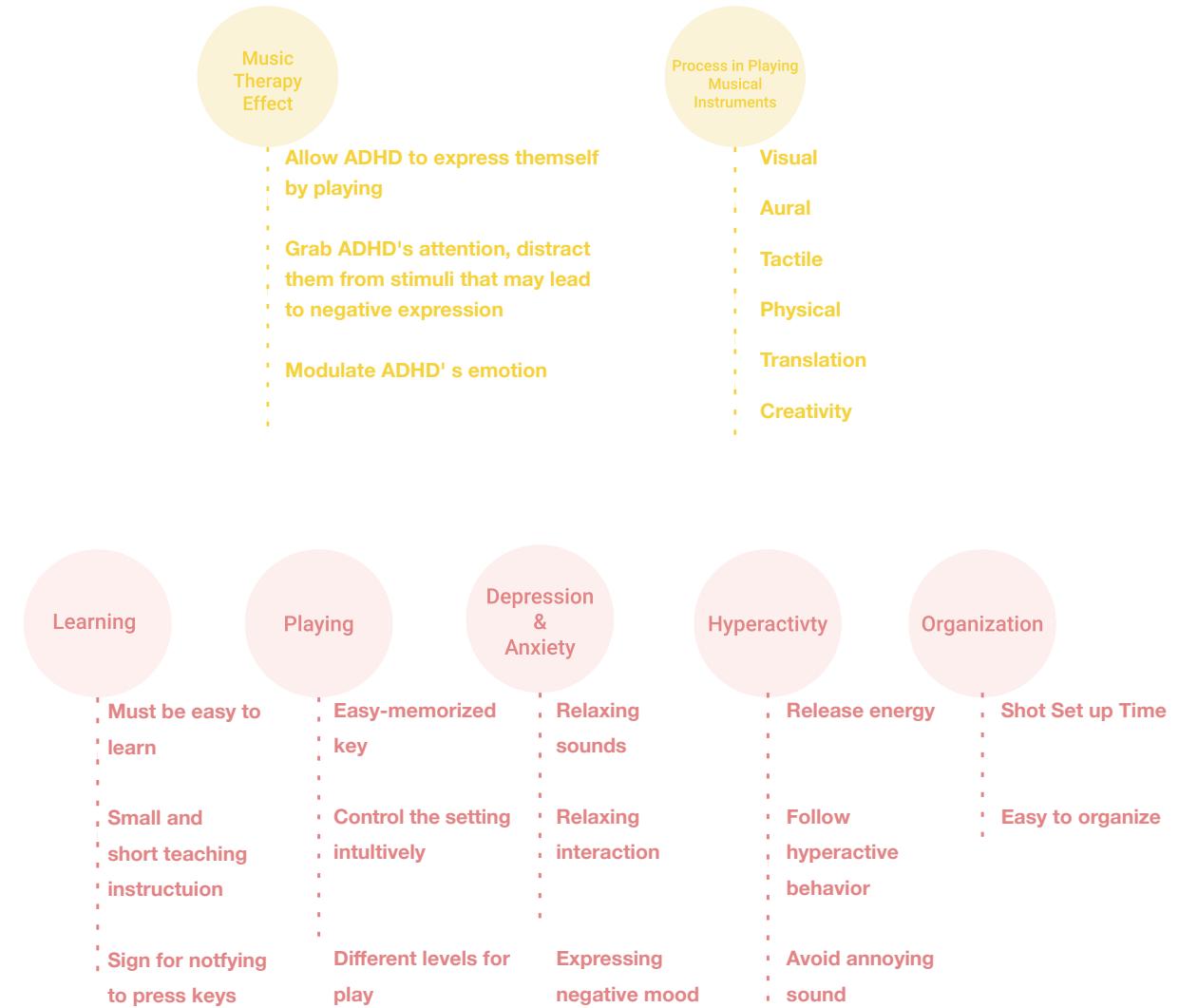
- the ADHD children to play the key.
2. There must be different levels of playing the musical instrument.

Depression & Anxiety

1. An anxious/depressed person must feel relaxed after playing the musical instrument.
 - a) The sound of the musical instrument should be relaxing (The sound should be referred to classical music/ yoga music/ concentration music, etc.)
 - b) The way of interacting with the instruments should release stress/ anxiety.
 - c) The way of interacting with the instrument should let the player express their negative mood.
 - d) The musical instrument must be learning easily and in a relaxing way.
 - e) The texture of the key should release stress/anxiety.
 - f) The smell of the instrument should be relaxing
 - g) The musical instrument should be used

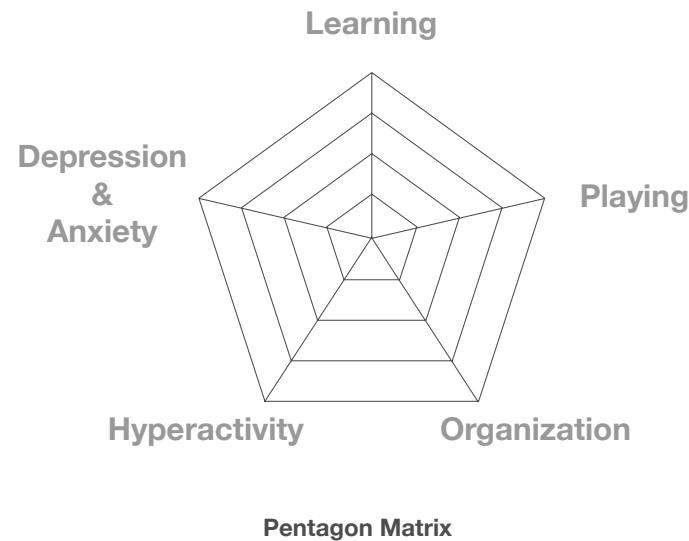
- whenever the user feels stressed.
- ### Hyperactivty
1. The musical instrument must release the hyperactive energy of ADHD children.
 2. The way to play the musical instrument should allow the ADHD children to consume energy.
 3. The sound of the musical instrument should express ADHD children's moods.
 4. The way to play the music instrument should follow some hyperactive presentation's behavior.

- ### Organization
1. The set-up time of the musical instrument should be short.
 2. The musical instrument must be easy for organizing.
 3. The musical instrument and service can encourage ADHD children to keep practicing the musical

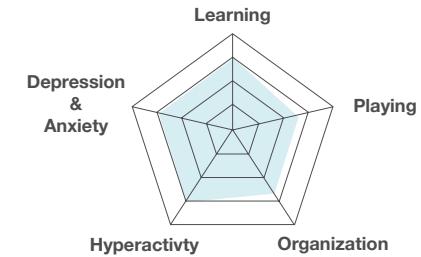


Market Research

Although there is no specific musical instrument designed for ADHD, based on the five requirements, the pentagon matrix was made for the marketing analysis on some non-traditional instrument support music.



Skoog



Descriptions

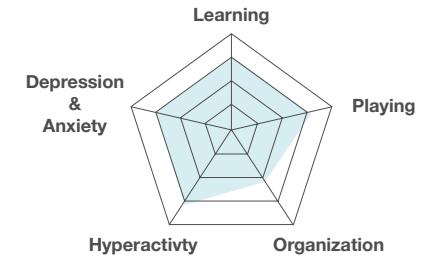
A tactile musical instrument that's unique in its level of accessibility. Can be tapped, twisted, squeezed. It requires to connect wirelessly to iPad or via USB to Mac using the free Skoog app.

Sources

<https://skoogmusic.com>



Soundbeam



Descriptions

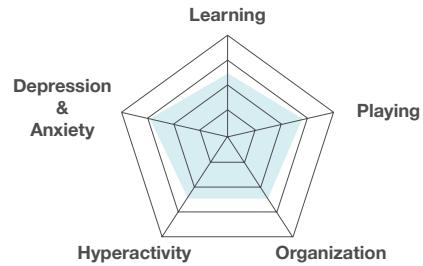
Come with pre-loaded 'soundsets' that range from tracks which allow the exploration and different performance. Completely programmable so that the user can change to personalize the soundsets.

Sources

<https://www.soundbeam.co.uk>



AlphaSphere

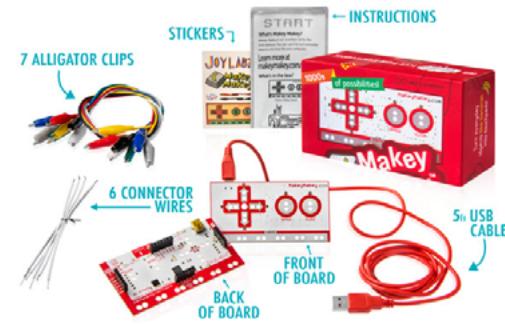


Descriptions

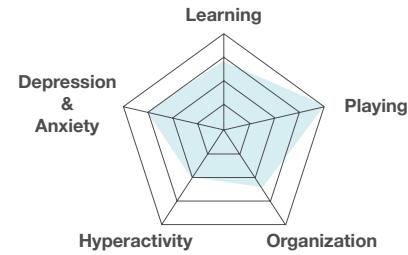
Each of tactile pads are pressure sensitive and ergonomically mapped around the surface of sphere. The geometric notational logic allows the custom mapping to be created between different pads.

Sources

<https://alphasphere.com>



Makey Makey

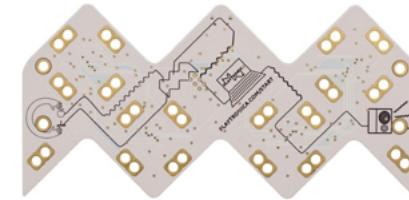


Descriptions

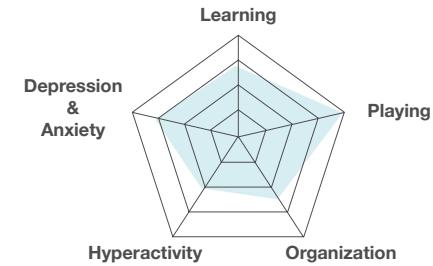
Include craft code. User can design own controller with everyday material like playdough or graphite pencils and control their favorite Scratch game while learning to code.

Sources

<https://makeymakey.com>



MIDI controller Playtron



Descriptions

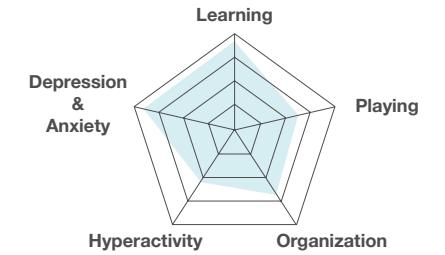
Encourage first step into understanding electronics: a fun toy for kids and grown-up alike. Need to connect to the computer. Tutorial Video. Can use a conductive object (water, fruits, even skin; anything electricity)

Sources

<https://shop.playtronica.com/playtron>



Skoog



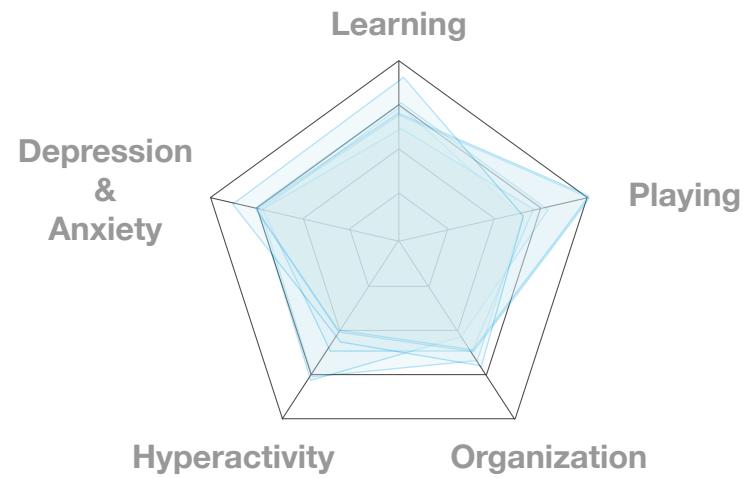
Descriptions

Easy to play – easy to use by referring musical score. Wide application – can carry with a travel bag for variety of activities, including music education, mind healing, toga, meditation, music therapist.

Sources

<https://www.youtube.com/watch?v=ZijiaolfSyw>

Market Analysis



In terms of the market analysis, the results of each product were overlapped showed in the above graph. The results show that non of the existing product can gain all the five elements' highest scores. Some of the products offer highly competitive in terms of playing or depression & anxiety, while the product shows less competition in the hyperactive, learning, and organization areas. ADHD children have more problems with learning and mood issues. Thus, the project for the future step will put more focus on the learning and mood swing (Hyperactivity elements and Depression & Anxiety) .

4. Design Brief

Design Brief

Project Name:

Inclusive musical toy for ADHD Children

Background:

Playing a musical instrument brings many benefits for ADHD children to improve their daily lives. However, some ADHD children have difficulties in learning to play musical instruments.

1) Some ADHD children have difficulties in learning playing musical instruments. they can not pay attention to the class, always act hyperactively, follow the instructions, and have difficulties reading notes. This situation also happens to the other musical instruments player.

2) ADHD children from 2 to 5 years old rely more on therapy as they are not suggested to take medicine while music therapy can only conduct.

3) Nowadays, many parents force children to learn musical instruments. However, it is better to let them explore their interests by themselves. 4 to 9 is the earliest suggested age for children to learn musical instruments.

Objectives:

- 1) Improve ADHD children's daily life
- 2) Modulate ADHD children's mood
- 3) Provide an enjoyable learning experience

Primary Target Group:

ADHD children(4-6 years old)

Place:

Home, since it can see an extension of music therapy and the children can use it under parents' instruction.

Project Requirements:

- 1) Learning: Create intuitive and enjoyable

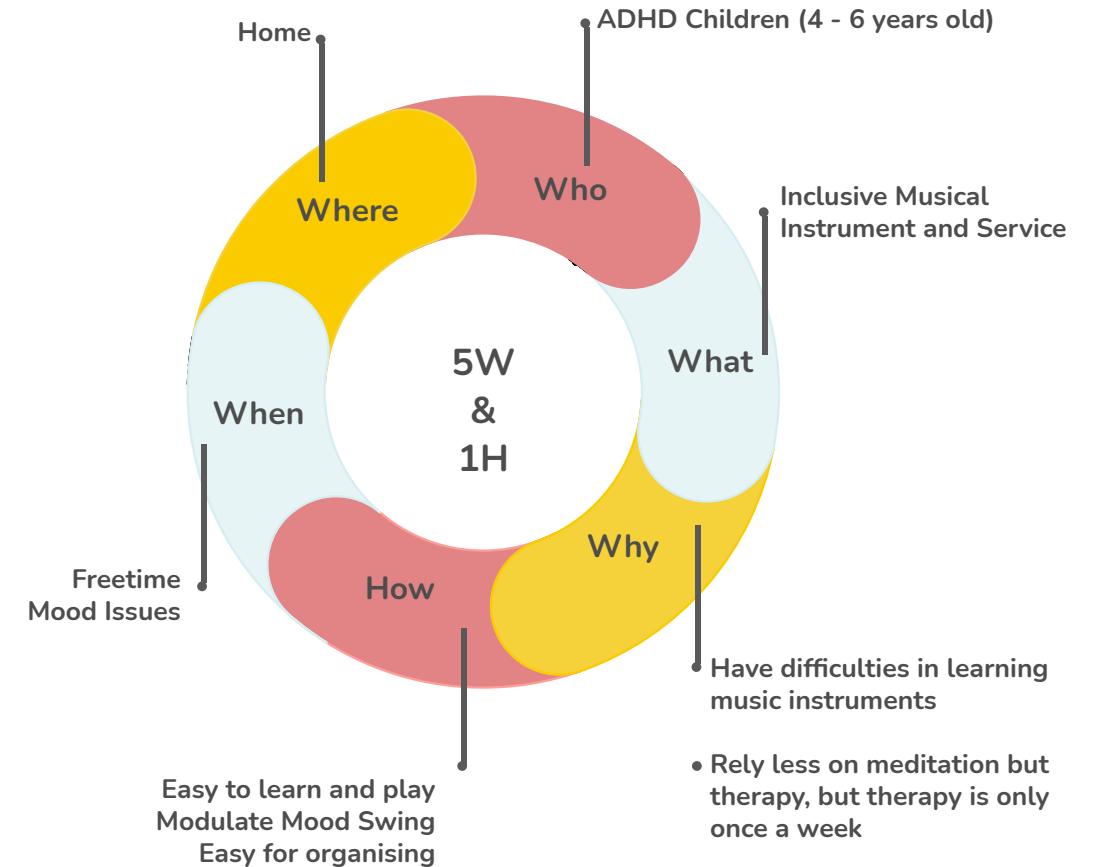
learning experiences.

2) Hyperactivity: Release hyperactivity.

3) Depression & Anxiety: Modulate depressive and anxious mood.

4) Organization: Easy for organizing and management.

5) Playing: Provides various playing experience.



Design Overview

- Rely less on meditation but therapy, but therapy is only once a week
- Provide a new playful thing to explore their interests.

5. Design Development

1) Directions Finalization

2) Final Direction

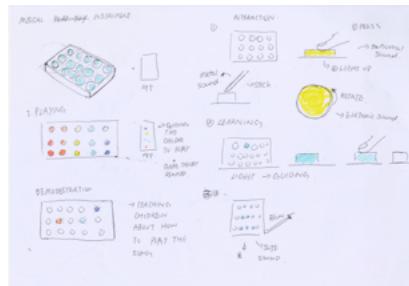
3) Form development

Four Directions

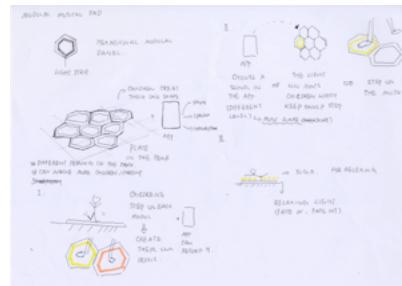
Based on the brainstorming, I generated into four directions: 1) Multifunctional Musical Toy Instruments; 2) Modular Musical Mat; 3) Musical Roly-Poly; 4) Musical Rolling Chair

Direction 1: Multifunctional Musical Toy Instruments

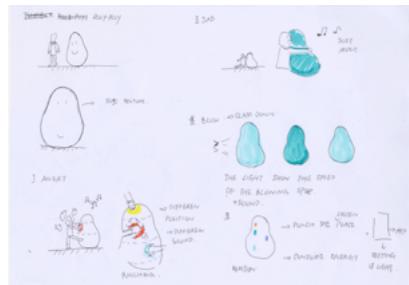
The multifunctional musical toy instrument support children in different ways to play, including pressing, rotate, blowing, etc. However, after look at some existing design in the market, there are already many these kinds of products



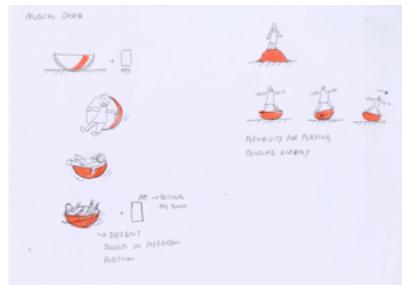
1. Multifunctional Musical Toy Instruments



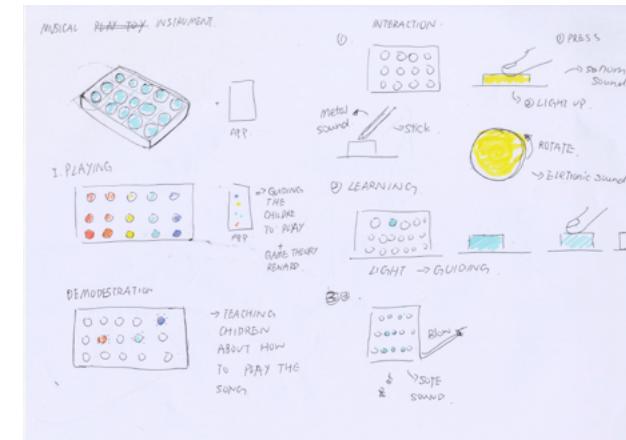
2. Modular Musical Mat



3. Musical Roly-Poly

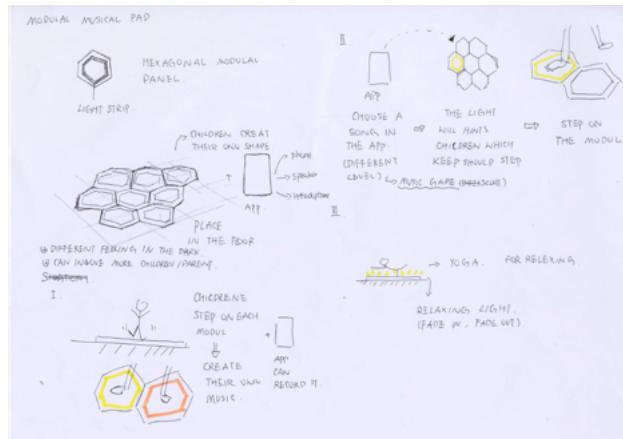


4. Musical Rolling Chair

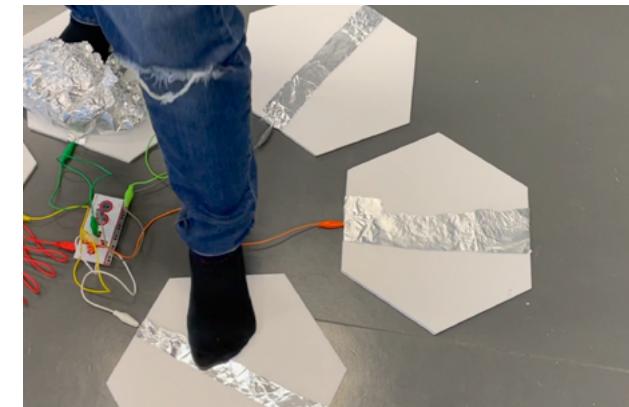
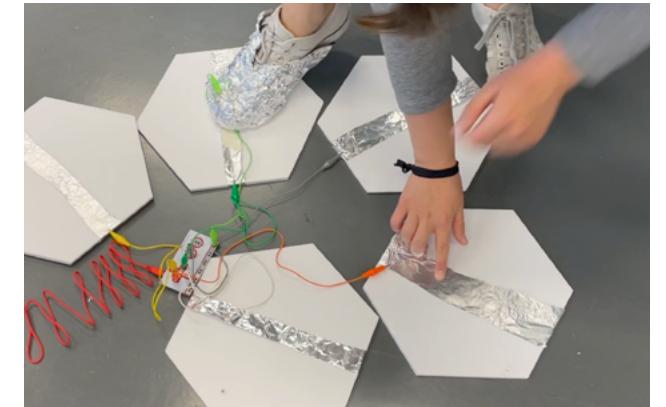
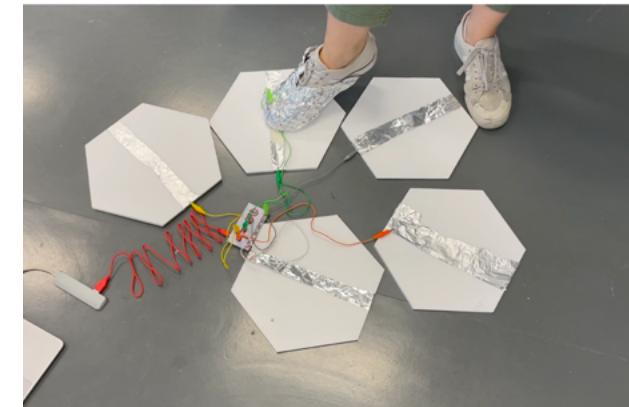


Direction 2: Modular Musical Mat

In this direction, each modular will have a sound when children step on it. Each module have light to guild children to step on it. Children can arrange the module by themselves. Although there are many similar products on the market, however, none of them are modular.

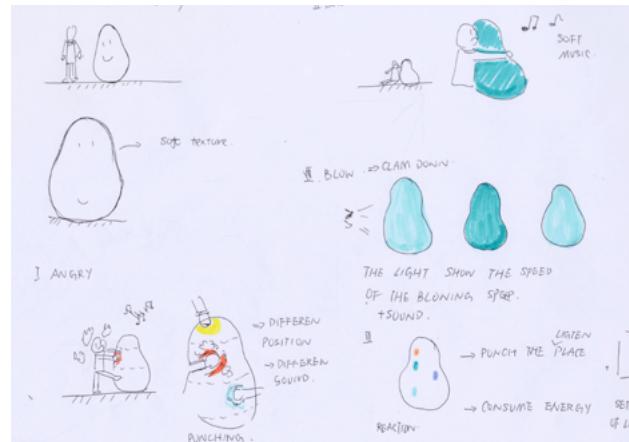


Direction 2: Rapid Prototype

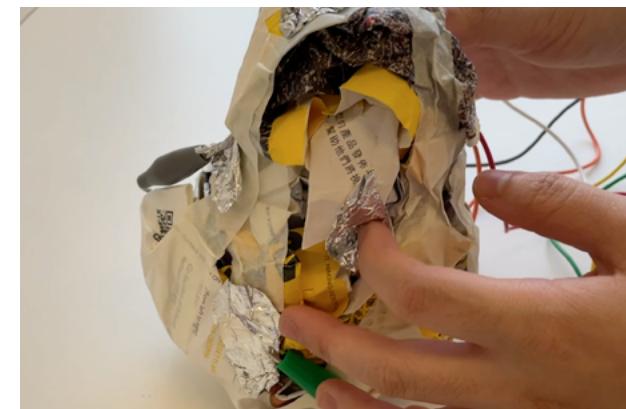
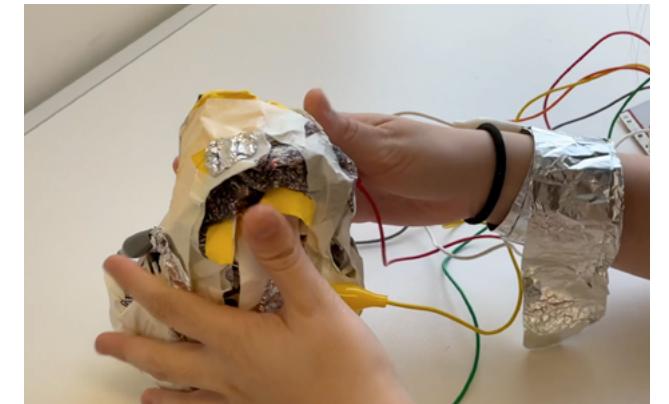
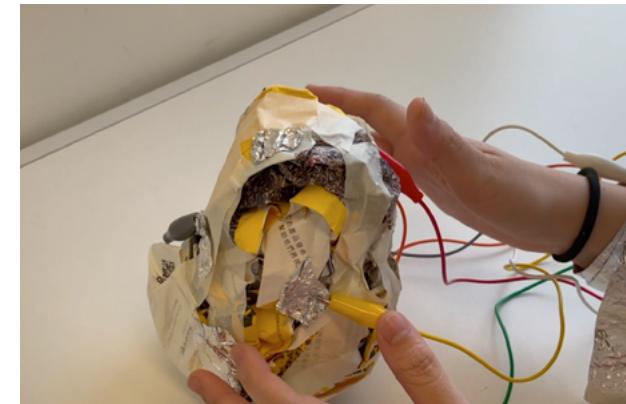


Direction 3: Musical Roly-Poly

The third direction is musical roly-poly. When the children are hyperactive, they can punch it, and there will be sound. When the children feel sad, they can hold the roly-poly, and there will be relaxing sound coming from the product. There is no similar design in the market.

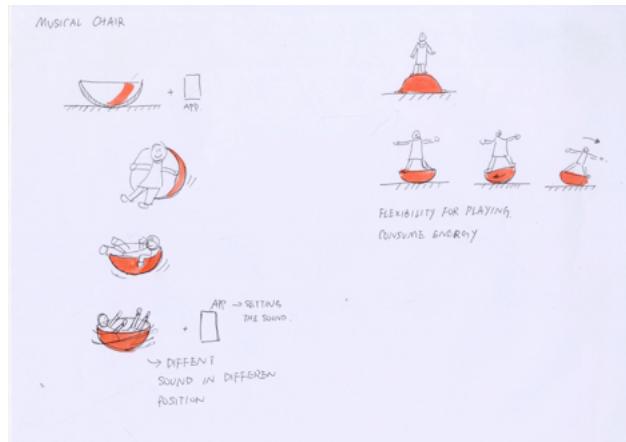


Direction 3: Rapid Prototype



Direction 4: Musical Rolling Chair

The fourth direction is a rolling chair; the sound will change based on the children's position. There is a less similar product on the market.



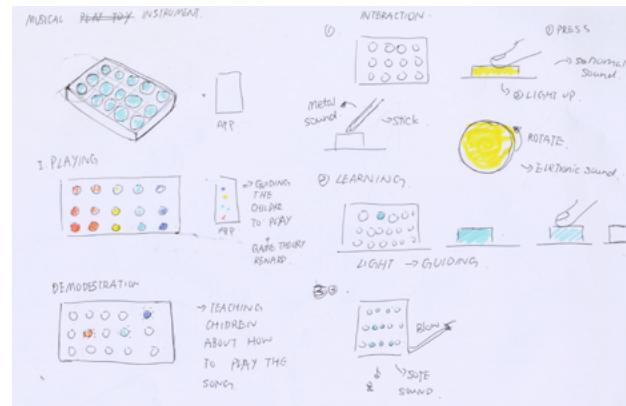
Direction 4: Rapid Prototype



Four Directions Analysis

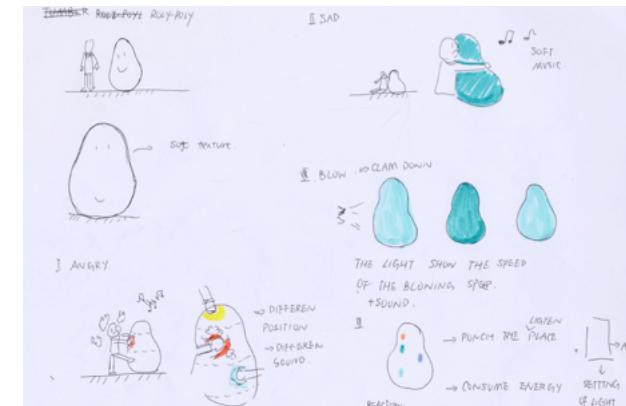
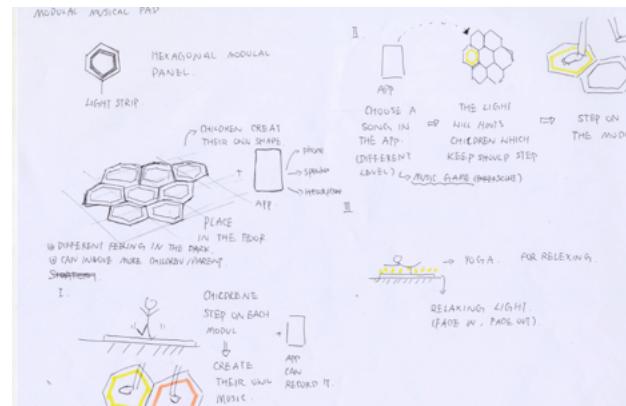
1. Multifunctional Musical Toy Instruments

- Already have many different similar products in the markets.



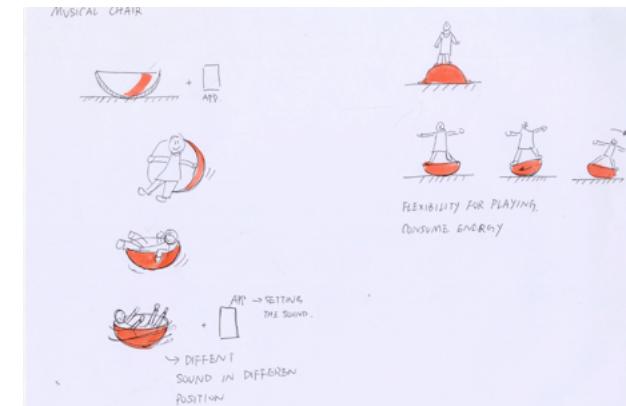
2. Modular Musical Mat

- Can encourage ADHD children to release their energy
- Less similar existing design



3. Musical Roly-Poly

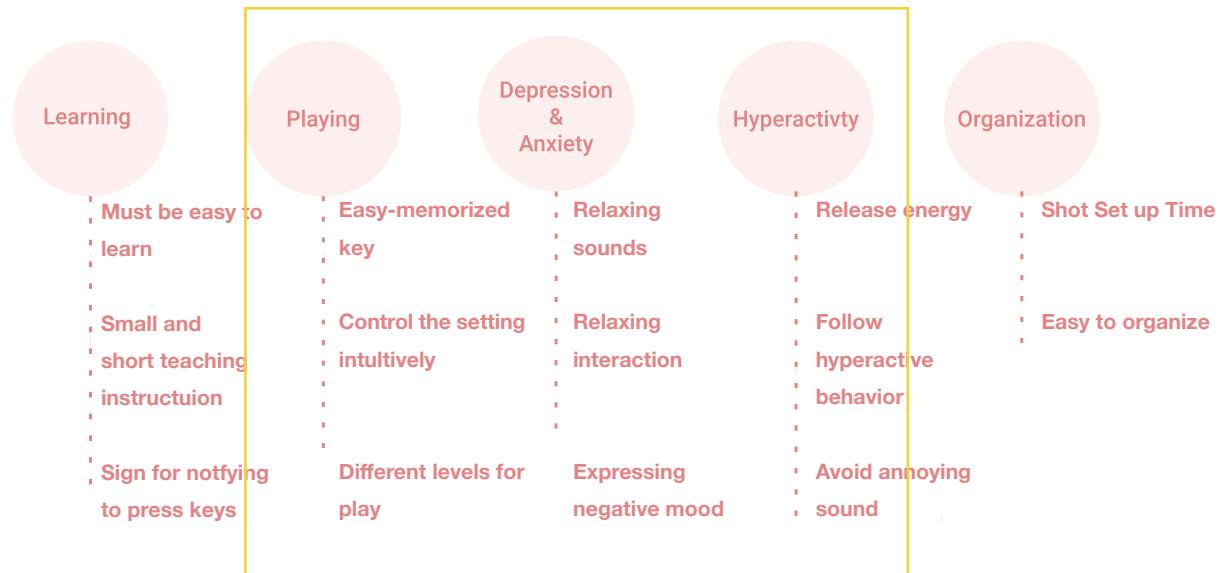
- It is amusing to have something to squeeze.
- Less similar existing design



4. Musical Rolling Chair

- Can encourage ADHD children to consume their energy
- Less similar existing design

Direction Focus

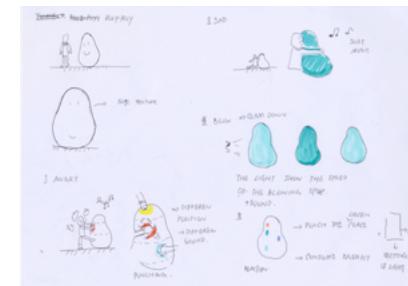


Overall, the first idea already has many different similar products in the market, while the second, third, and fourth idea has less similar products. Then I think there are fewer toys for children to release energy, so I decided to focus on the hyperactivity aspects. There is also scientific proof that humans can have a higher concentration on doing the task after exercise. Also, exercise can provide depression and anxiety in the long term. The toy will also offer free play in the design.

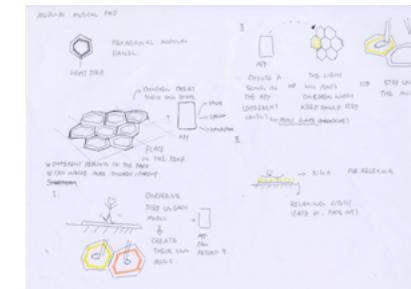
Verbal Testing



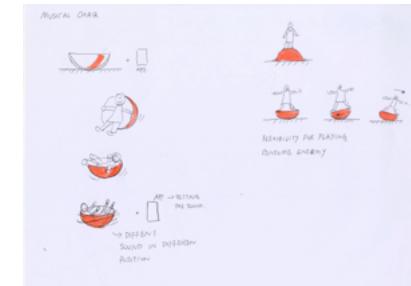
1. Multifunctional Musical Toy Instruments



3. Musical Roly-Poly



2. Modular Musical Mat



4. Musical Rolling Chair

Question:

- Which idea do you think can consume ADHD children more energy?
- Anything Remarks

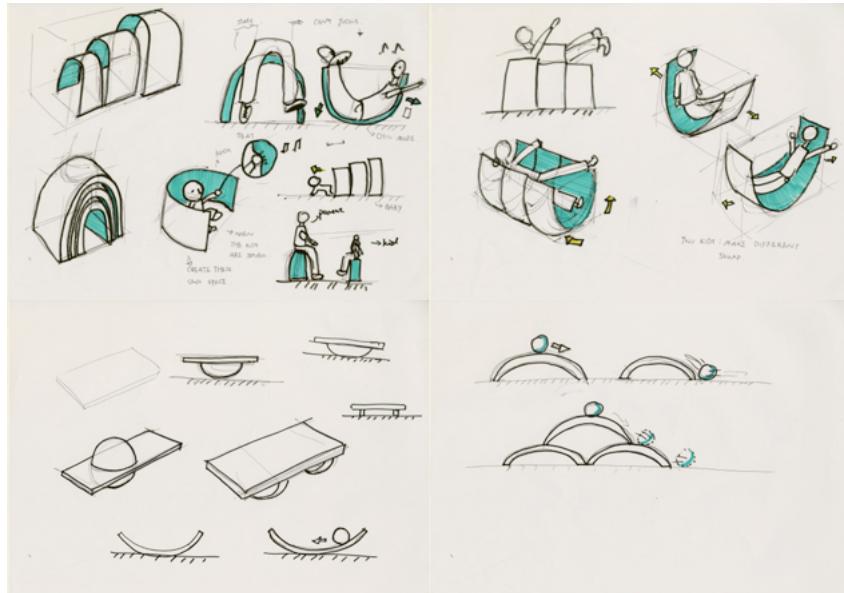
Insights

- Most of them think 3 and 4 are enjoyable to play
- However, 2 and 4 can consume more energy for ADHD children since the children can move more.
- Based on his experience, ADHD likes to move a lot, like climbing.
- ADHD children love the game, but the types of games they like vary by individual preference.
- ADHD children probably won't care about the story.

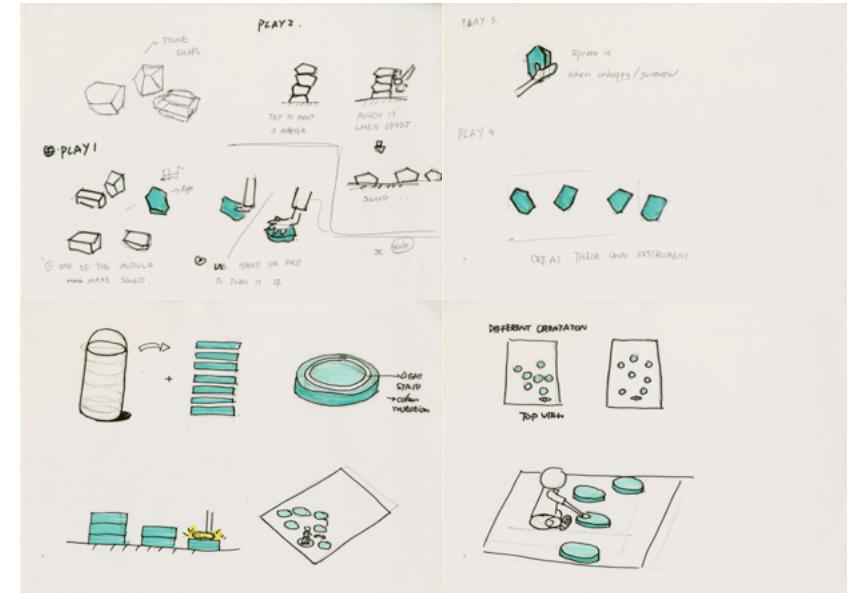
Further Development

Then think the modular musical mat and the musical rolling chair can allow ADHD children more energy.

I kept developing the two ideas. However, the chair's statements seem more dangerous, while the musical mat ideas seem safer.



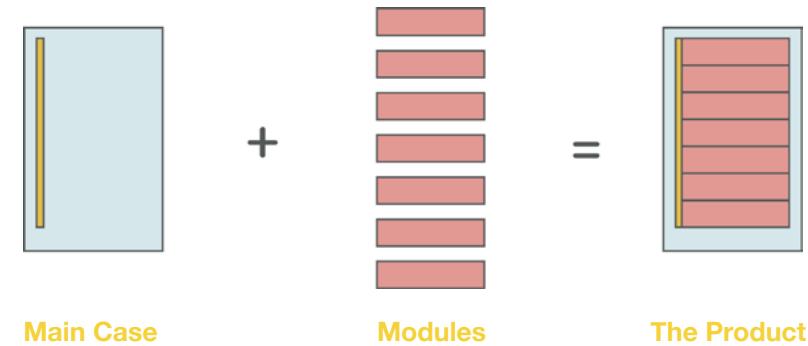
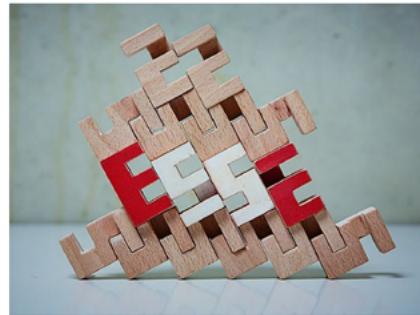
Further Development:
Rolling Chair



Further Development:
Modular Musical Mat

Final Design Direction

Inspired by the traditional toy brick, it supports free-to-play, which matches the project goal.

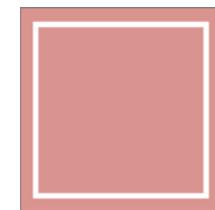


Main Case

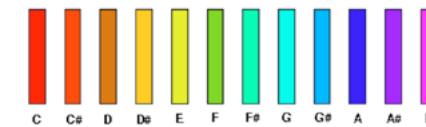
Modules

The Product

There are two parts, which include the main case and seven modules. The function of the main case is for charging the modules, and it will be easy for the parent to organize. It can also be used as a temporary stool, and there will be an integrated remote control on it as the children will lose it quickly if it is single. In terms of the modules, 7 represent seven notes in the music instruments, and the modular design also supports free play. On each module, there will be an RGB light strip to indicate the music color notation.



Module: Top View

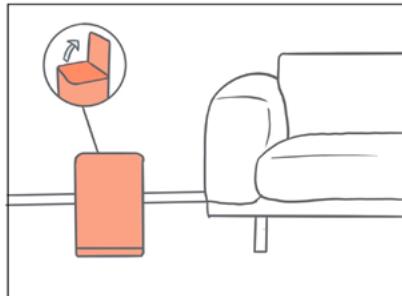


Music Colour Notation

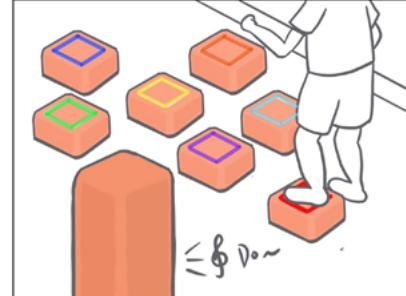
Storyboard



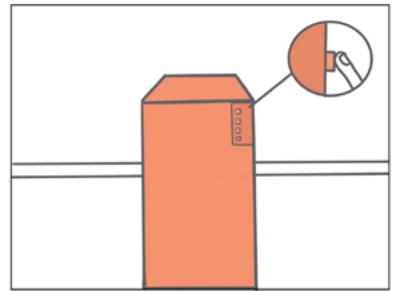
1. ADHD Children : hyperactive, inattention, anxious



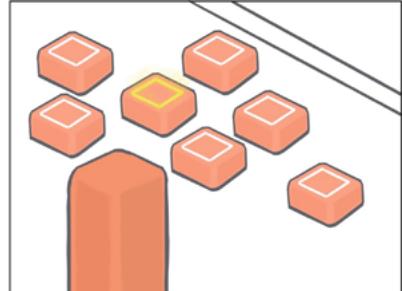
2. Take Out the modules



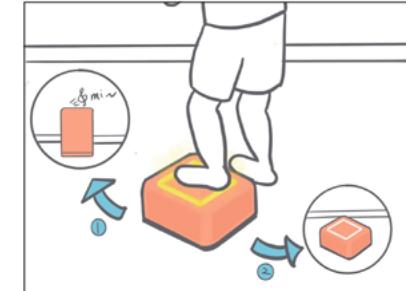
3. Step on the modules



4. Change the mode / sound

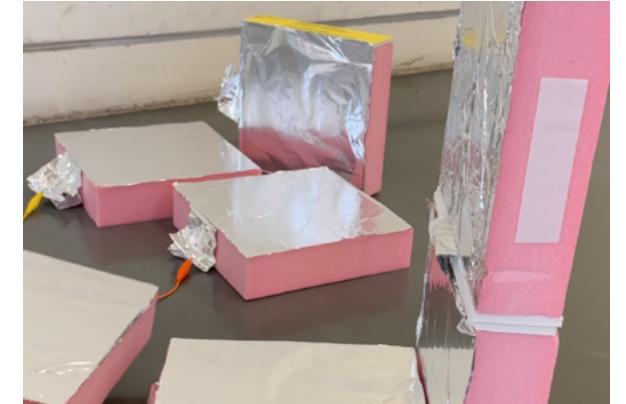


5. Mode 2: one modular blink



6. Mode 2: Children need to step on it, then will have one sound

Direction 3: Rapid Prototype



Design Language

Keywords: Geometric, Playful, Futuristic



Moodboard

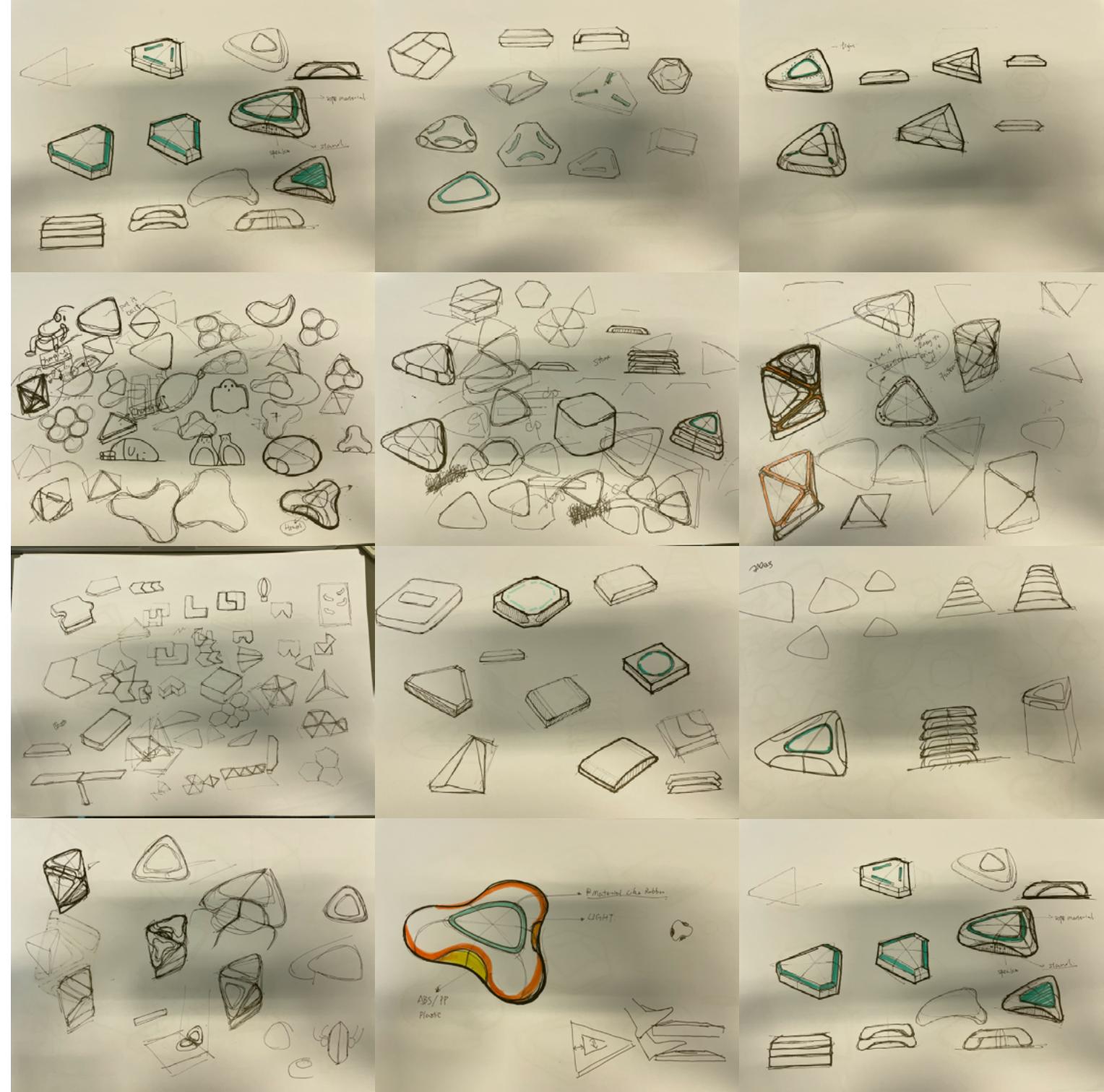
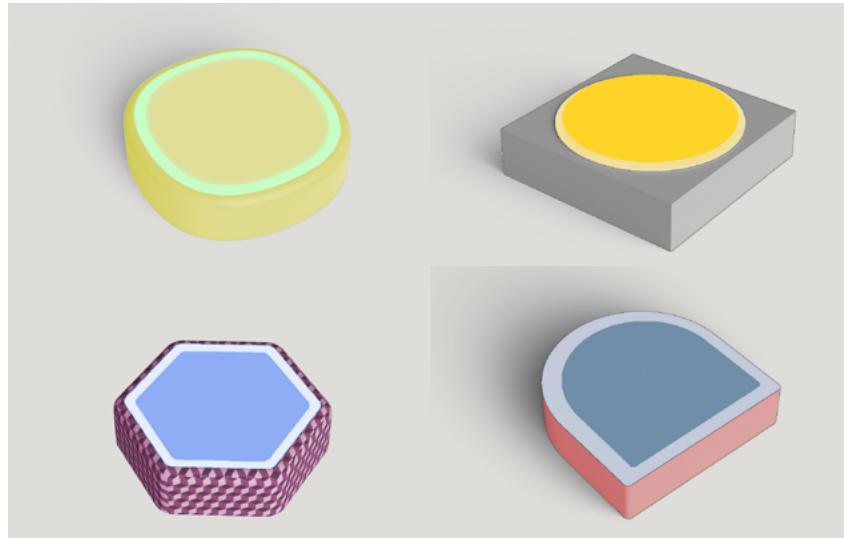
Keywords: Futuristic, Adorable



Form Development 1 & 2

For the first round of development, I design the module with a simple geometric shape (Image below). However, the edge of the module is too sharp, which may cause danger to children.

Then I did the second round for form development (Right Images); compared to the first round, the shape is more organic, but still keep it in a simple geometric shape.



Form Development 3: Prototype

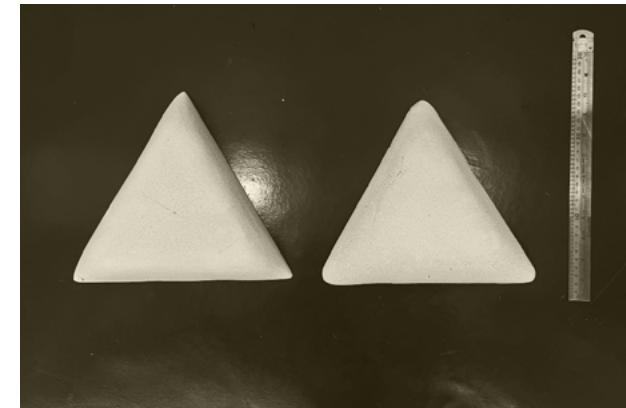


Although I have already many different drawing in different shapes, I couldn't choose anyone of it. It seems like I can choose whatever shape I like, but at the same time, there was no specific reason for me to select the form. Later on, I got some suggestions from my tutor to think about the whole same together. The sketches that I did only consider the module's shape but didn't consider the base part.

The simplest way for me to design the base is to design a case only for charing the module. However, it will occupy a lot of space at home since the module will be already massive, as it refers to the children's foot size. Thus, I gave myself some time to think about the shape.

My instinct told me that I could think about seven modules since there are seven modules for my project.

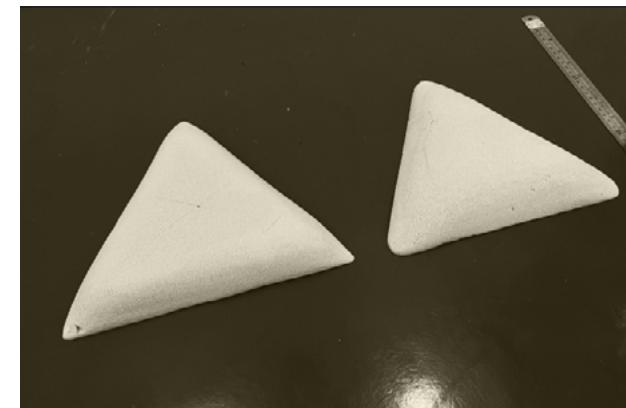
Later on, I found an origami called Octahedron (left) form, which includes eight surfaces; each surface is in a triangle. Thus I decided that the shape of the module will be a triangle. Initially, I thought that when the user stores the modules, the modules can be self-connected into Octahedron shape like folding origami. However, I was judge by my tutor that it will be difficult for the



user to do. I was about to give up this idea; suddenly, a good solution came into my mind: to make the Octaheron solid so all the modules can use attache on the surface.

When I was halfway through my form development, one day, I realized that a full music scale usually has eight music notes. Although the eighth one is the same as the first one in a higher pitch, it still gives people a complete feeling. Thus, I changed my base shape; it became a form with ten faces, eight surfaces in the triangle, and two square surfaces.

Since the module's shape will be a triangle, I did two green form prototypes to see which curvature will be better from the bottom to top. The prototype of the left one has a more flat surface on the top, while the right-hand one has a more rounded surface. Later on, I tried to step on the prototype with the barefoot and asked people who have a smaller foot to try which shape is more comfortable. The more rounded on the surface, the more comfortable it will be and cause less danger to children. Both sizes are refer to preschool children's foot and popliteal height.



Form Development 4



On the third round of form development, I focus on some small detail of the modules.

I tried different colors on the module. Then I realize that if there is a color on the module, it probably will affect the feeling when the user sees the color of light strips since the color of the light strips needs to hint at the music note.

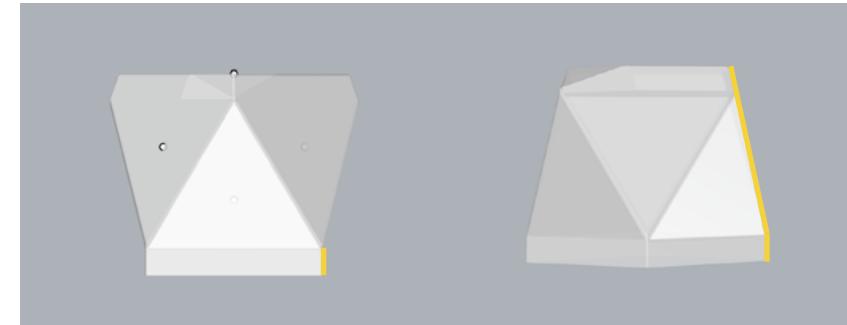


I also tried different shapes for the lighting area and some decorations on the module. The main direction is that the module won't hint at gender and will look futuristic. Some of it seems more robotic, and some of it seems more organic. I preferred the more organic one (The bottom one), and I asked people's opinions, all of them also chose the more organic one.

Form Development 5



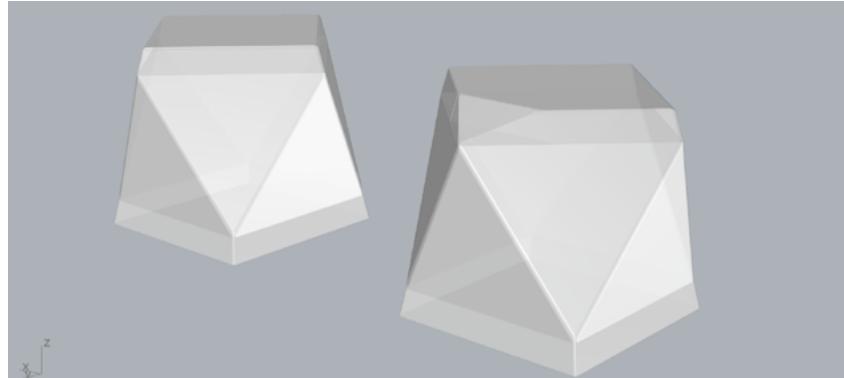
Since there are two similar organic shapes, try to compare the two: one is with grey decoration, and another one doesn't have it. Consider from the material, which the cover layer of the material probably will be silicon. Thus I choose the bottom one for my final module design.



I made some slight adjustments to the bottom part for the seat part to make it look more stable. The final version, in one of the view the edge is aligned.



Form Development 6



The Interface also needs to be integrated into the seat. There are two considerations, either put the screen aligned with the cushion or make the screen slanted in 45 degrees, which will be easy to look. In the end, I choose the slanted one since the cushion's size will change when people use it for a longer time, which will not be aligned with the screen.

Interaction Testing



Question:

- For the mode about play song, when should the user step on the module in a song?
- Anything Remarks

Insights

- It will be challenging for the participants to step on the module base on the melody.
- The user can follow the first beat in a song to react to the following notification and step on it.
- The participant finds a sense of achievement when finishing one song.

6. Final Design

OCTAPS

Tap Play Music

OCTAPAS is a inclusive music toy for ADHD preschool childrens(4-6 years old).

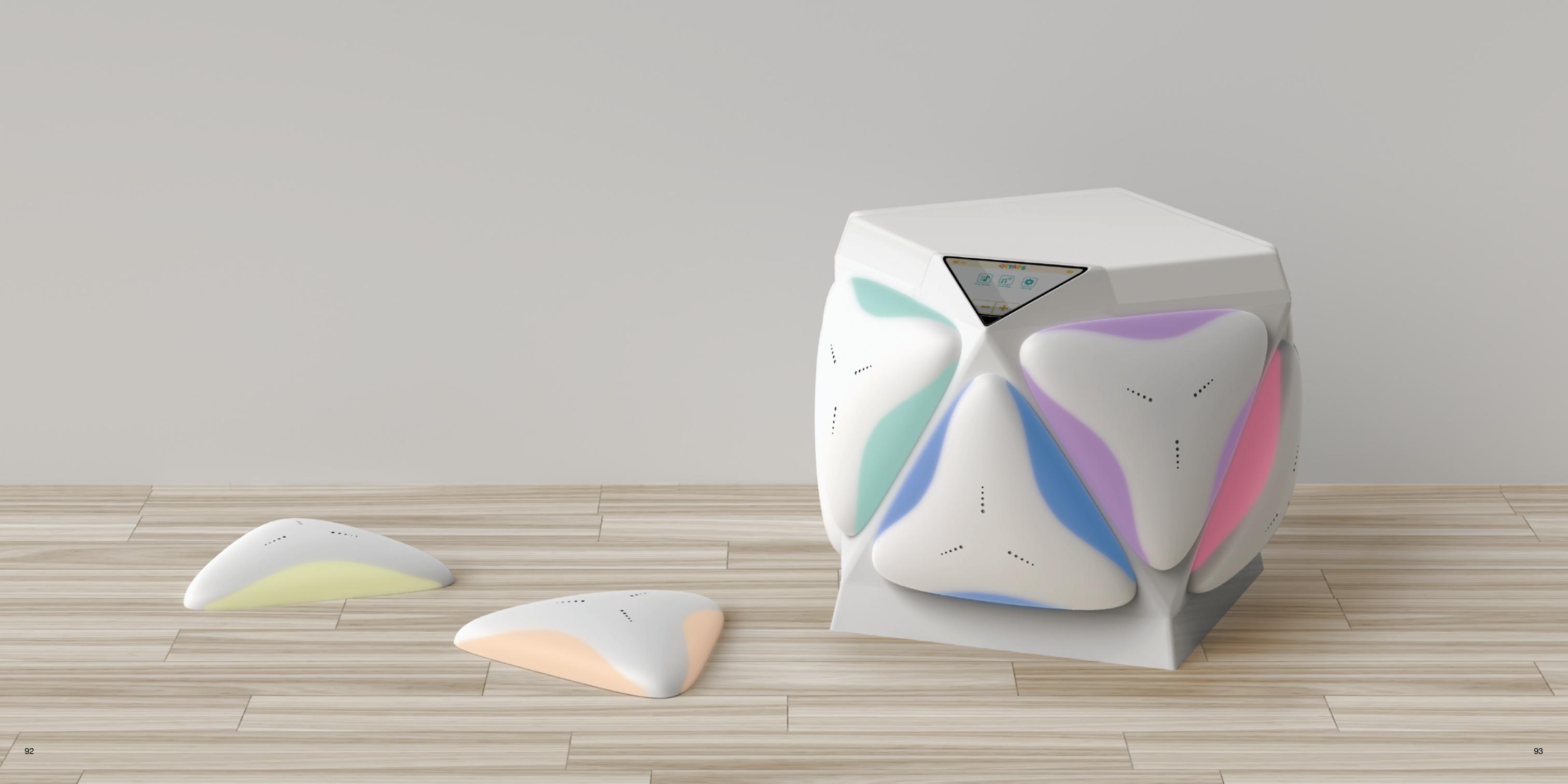
OCTAPAS aims to provide preschool children a music toy to:

Release their energy at home

Explore their interest in music

Support free play for children





There are mainly two parts for OCTAPS : 1) Triangle Modules 2) Stool.
Both of them are redesigned ergonomically for preschool children.



Triangle Modules

Octaps has eight triangle modules that represent the eight musical notes on a full music scale. Each module contains a light strip and speaker inside. The color of the light strips hints at the different notes based on the color music notation. Once children tap on the module, the speaker will play the sound.





Stool

The geometric shape stool has eight surfaces providing the eight triangle modules magnetic wireless charging.







Two Play Mode

Play Songs



1. OCTAPS provided different songs for children to play.



2. Demonstration Mode: The modules will play the song automatically.

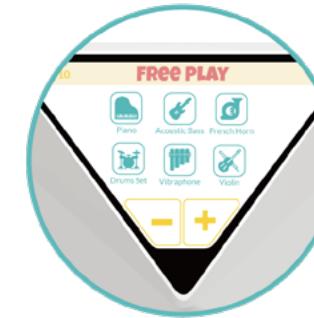


3. Practice Mode: The light will guide the children to play the songs.



4. Perform mode: Children need to play the song based on memory.

Free Play



1. OCTAPS provided 8 different instruments and sounds.



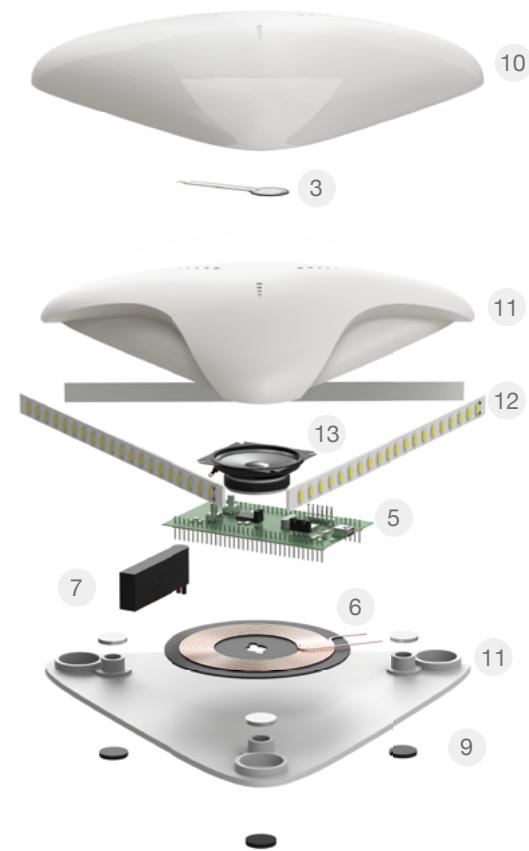
2. Surprise Sounds: Provides different unexpected sounds everytime.



3. Children can create their music by tapping on the modules..

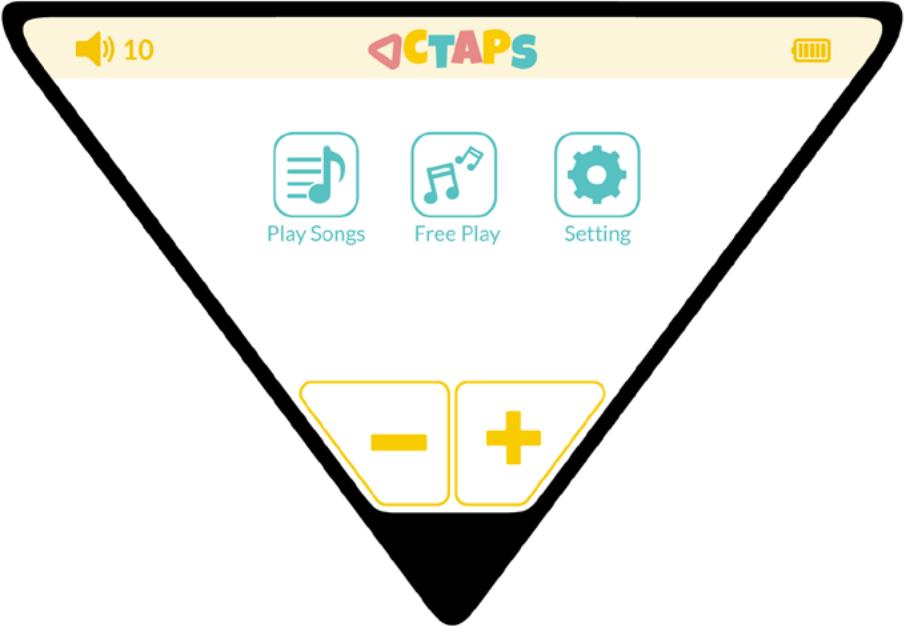


4. Children can put the module on the stool. They can sit on it and play.

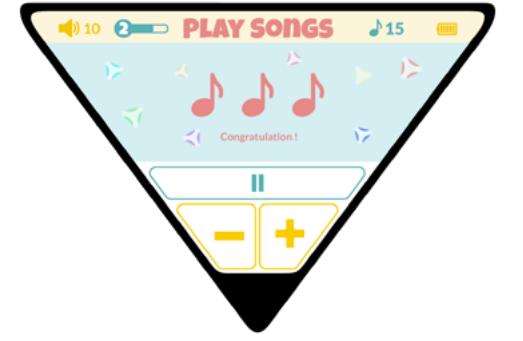
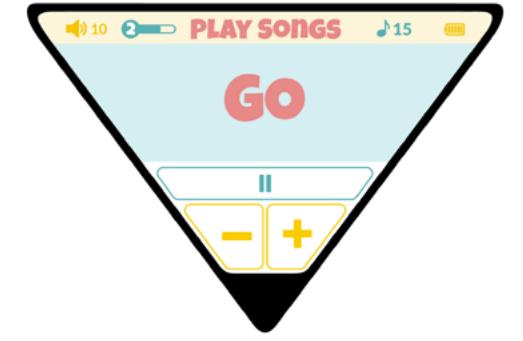
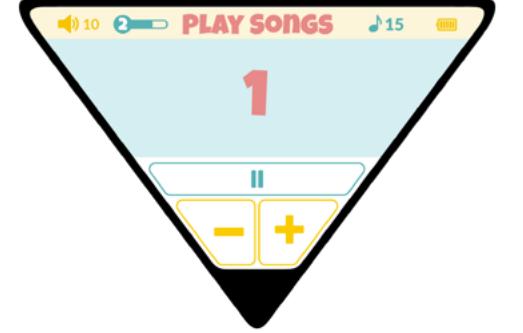


1. Screen and Button
2. Cushion
3. Force Sensor
4. Stool Body (PP plastic)
5. PCB
6. Wireless charging coil
7. Battery
8. Magnet
9. Rubber
10. Triangle Module Case (Silicon)
11. Triangle Module Body (PP plastic)
12. RGB light strip
13. Speakers

Interface



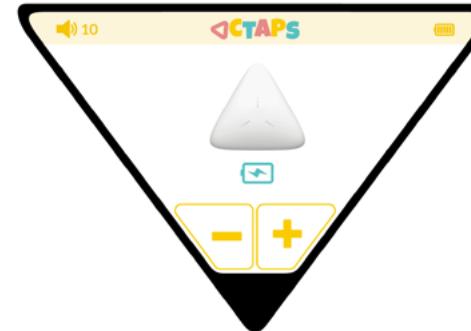
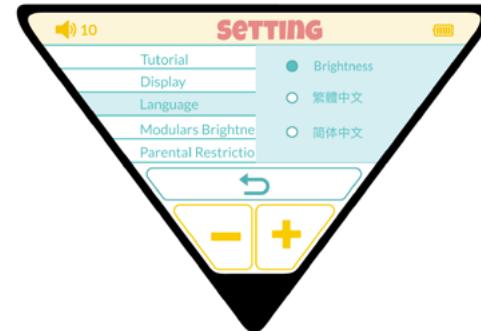
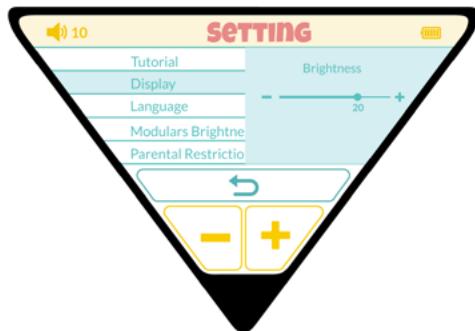
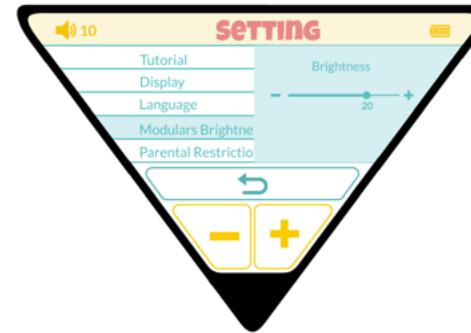
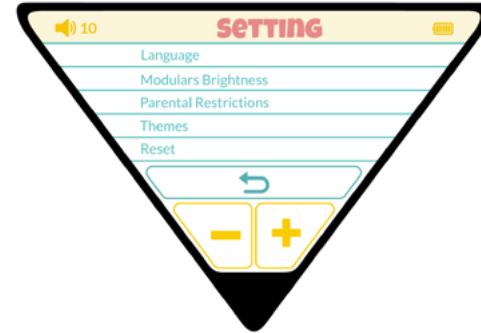
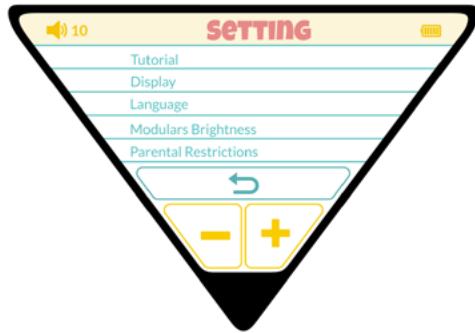
Interface : Play Song



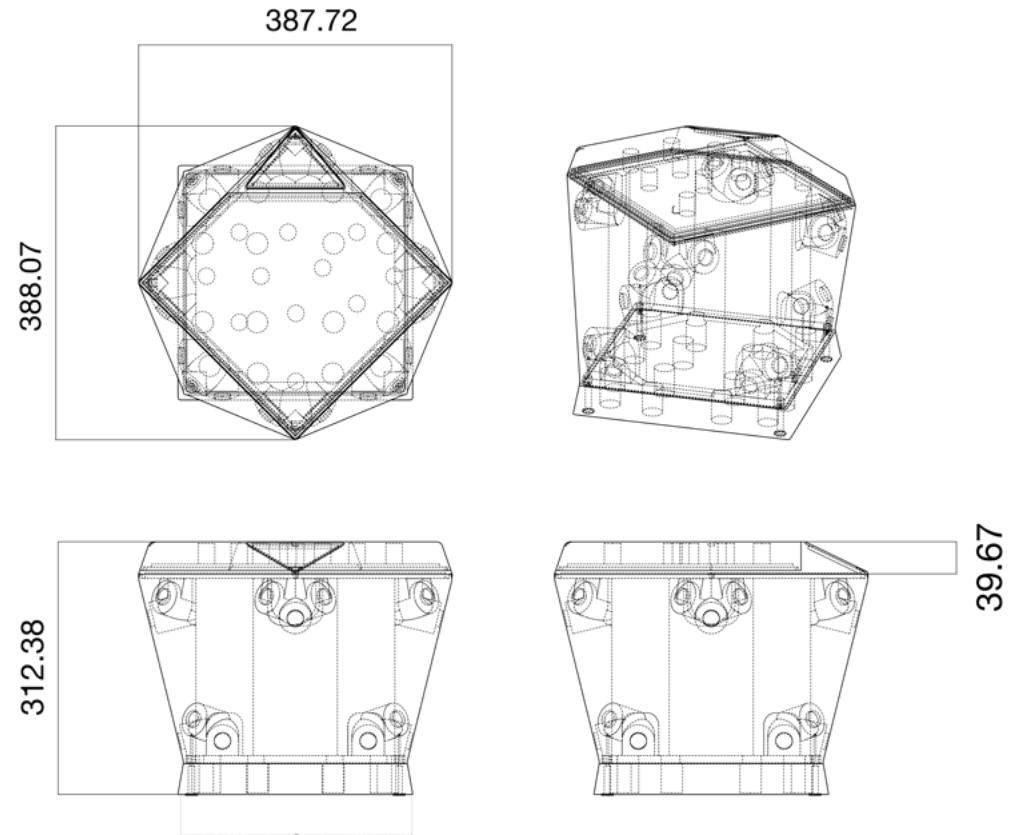
Interface : Free Play



Interface : Setting



Production Drawing



7. Reflection & Evaluation

Reflection & Evaluation

This the last project that I did in my bachelor's life. All of us spend one year doing this project. During this journey, I think I achieve some of my initial vision for this project, explore myself, and found shortcomings.

My initial vision for designing my final year project is that the design is playful and creates a unique user experience. Seeing the outcome, I think I achieve it. Besides, working on a project is also challenging. Nobody will push me to do anything, which requires high self-discipline. However, working alone sometimes also leads to self-doubt and mental break. During doing the project, I tried to push myself under the case won't cause a substantial mental break, which let me realize that I can project alone and learn the skills of product management.

I think project time management is the most crucial thing in doing the final project. Everyone has talented ideas at the end. However, there is a saying, 'Designers never have enough time,' which is true. If I have more time, or if I have a little bit better time management, I can do more. One thing that I realize for my project at the end is that I can explore a bit more on the interaction part, to explore the scenario that more than one person plays the product. However, after the interim presentation, I almost spend the rest time doing the form development. Maybe that shouldn't take that long. However, there is always some small detail I am not satisfied with, and there is always some small detail I need to consider. If I can have better time management, I won't struggle too much on some minor information and spend less time.

Overall, final year project is a challenging and memorable experience. It is not an end; it is a starting point of designers life.

8. Reference & Appendix

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Appendix 1



INFORMED CONSENT (For participating on one-to-one interviews)

Dear Participant

I am carrying out a research study for my bachelor capstone project in the School of Design of The Hong Kong Polytechnic University. The purpose of the study is to understand the difficulties for ADHD children (4 -9 years old) on learning musical instruments. The results will help the industry to design better musical instruments and service in the future.

Your participation will consist of a one-to-one interview, lasting approximately 20 minutes, which will be recorded for analysis. Your participation is voluntary, and you have the right to withdraw from the interview at any moment for any reason without penalty of any kind.

All the information will be confidential and will be deleted from the audio recorder/dictaphone after analysis. There are no predicted risks as a result of your participation. All references and quotes used in the research will be anonymous. If you want further information about this research, you can contact my project tutor Dr Tulio Maximo by the email tperei@polyu.edu.hk or phone +852 69371685.

Yours faithfully,
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CONSENT TO PARTICIPATE IN RESEARCH

USERS' PERCEPTION OVER WALKING AIDS USE

I _____ hereby consent to participate in the captioned research conducted by _____.

I understand that information obtained from this research may be used in future research and published. However, my right to privacy will be retained, i.e. my personal details will not be revealed.

The procedure as set out in the attached information sheet has been fully explained. I understand the benefit and risks involved. My participation in the project is voluntary.

I acknowledge that I have the right to question any part of the procedure and can withdraw at any time without penalty of any kind.

Name of participant _____

Signature of participant _____

Name of Parent or Guardian (if applicable) _____

Signature of Parent or Guardian (if applicable) _____

Name of researcher _____

Signature of researcher _____

Date _____

參與研究同意書

研究項目標題

本人_____同意參與由_____開展的上述研究。

本人知悉此研究所得的資料可能被用作日後的研究及發表，但本人的私隱權利將得以保留，即本人的個人資料不會被公開。

研究人員已向本人清楚解釋列在所附資料卡上的研究程序，本人明瞭當中涉及的利益及風險；本人自願參與研究項目。

本人知悉本人有權就程序的任何部分提出疑問，並有權隨時退出而不受任何懲處。

參與者姓名 _____

參與者簽署 _____

家長或監護人(如適用) 姓名 _____

家長或監護人(如適用) 簽署 _____

研究人員姓名 _____

研究人員簽署 _____

日期 _____

Appendix 2

A. Interview Questions for ADHD Children Parents

General Questions

1. Which age group is your ADHD child in?
 - 2-5 years old
 - 6-12 years old
 - 13 – 16 years old
 - 16 – 18 years old
2. Which types of ADHD you child is?
3. What kinds of symptoms are reflecting in your child?

Music Therapy

1. Does your child participate in music therapy?
2. How often do your child have music therapy?
3. What do your child will do in music therapy?
4. How does music therapy improve the child's daily performance?

Playing the Musical Instruments

1. Does your child play musical instruments?
2. Which musical instruments does your child play? Why this instrument?
3. How does the child start playing musical instruments?
4. How long have you child started playing the musical instruments?
5. How long would the child practice play musical instruments each time usually?
6. How often do the children practice playing the musical instrument?
7. Any difficulties do the ADHD child face when are they playing the musical instruments?
8. How does your child overcome the challenges?
9. How do you help your child to overcome the difficulties?
10. How does playing musical instruments improve the child's daily performance?

Music in Daily life

1. What types of music do your child like listening?

- a) What kinds of reaction will the child shows?
 - b) Why do you think your child like it?
 - c) How does it affect your child's mood and daily performance?
2. What types of music do you child dislike to listen?
 - a) What kinds of reaction will the child shows?
 - b) Why do you think your child like it?
 - c) How does it affect your child's mood daily performance?
 3. When or what kinds of situation would the child like to listen to music in a day?
 4. Some music apps like Garage Band are quite popular today. Does your child enjoy playing it?
 - a) How long will your child usually will play with it?
 - b) How does your child play it?
 - c) Which part of the app you think is the most attractive part to your child?
 - d) How does playing the game improve the child's daily performance?

- e) How does it affect your child's mood and daily performance?

B. Questions for ADHD Adults

General Questions

1. Which age group are you in
 - 18 -22 years old
 - 22 - 26
 - 27 – 30
 - 30 – 35
 - 35 – 45
 - 45 – 55
2. Which types of ADHD are you? (leave to the end, change the way to ask , or option)
3. What kinds of symptoms are reflecting on yourself?
4. Do you play musical instruments? (If yes, will further ask the question about "Play the Musical Instrument", then "Music in Daily Life")

(If no, will ask about "Music in the Life" directly)

Playing the Musical Instruments

1. Which instruments do you play? For the interviewee (try to) play more than one musical instrument.
 - a) Which musical instruments you like to play most? Why?
 - b) How long does it takes for the first time you to learn the tools?
 - c) How long does it takes for you to learn the instruments after you have already learned one musical instrument, compared to the first one you knew?
3. How many years have you been playing instruments?
4. How do you start playing musical instruments?
5. How often do you play musical instruments? Why?
6. How long can you focus on practicing musical instruments each time usually?

7. What kinds of difficulties have you faced when you learned playing the musical instruments?

- a) For the interviewee (try to) play more than one musical instrument.
 - b) Which musical instrument do you find the most difficult to learn? Why?
8. How did you overcome the difficulties?
 9. How does playing musical instruments improve your daily life performance?
 10. What suggestions will you give for the ADHD musical instruments beginner?

Music in Daily Life

1. What types of music do you like to listen?
 - a) When will you hear?
 - b) Why do you like it?
 - c) How does it affect to your mood and daily performance?
2. What types of music do you dislike listening?
 - a) Why don't you think you like it?

C. Questions for Music therapists

General Questions

1. How many years have you been working in music therapy?
2. How many children have you taught before?
3. Which age groups are the children you mainly train before?
4. What types of ADHD children have trained before?

Music Therapy

1. What kinds of activities would you have during music therapy?
2. What are the purpose of each activity?
3. How do you prepared the activities based on their situation?
4. How many ADHD children will there for each times' therapy?
5. Based on your observation and feedback from the children's parents, how

does music therapy improve ADHD children's daily performance?

Musical instrument in Music Therapy

1. Which musical instrument will you adopt and involved the ADHD children to play during the music therapy session for ADHD children? Why you choose it?
2. Some music application like 'Garage Band' and some new music instrument, like 'Skoog' are quite popular today. Have you also adopted during the musical therapy?
 - a) If you have, which application you used?
 - b) What are the benefits about using it compared to the traditional musical instrument?
 - c) Is there any limitation about using it?
3. How you use the music instrument/ device during the music therapy secession?
4. How would this activity it helps the

ADHD children?

Playing the Musical Instruments

1. What is the differences on teaching musical instrument for ADHD children with non-ADHD children?
2. Which musical instrument would you recommend ADHD children to learn? Why?
3. What kinds of difficulties do the ADHD children face when they learned playing the musical instruments?
4. How do you help them overcome the challenges?
5. Based on your observation and parent's feedback, how does play the musical instrument improve ADHD children's daily performance?

D. Questions for Music Instrument instructors for ADHD

General Questions

1. How many years have you been teaching musical instruments to ADHD?
2. How many ADHD children have you taught before?
3. Which age group are the ADHD children you train before?
4. Which musical instrument do you teach?

Playing the Musical Instruments

1. What kinds of difficulties do the ADHD

