



Democratising design for Down syndrome

A DfDIY buildkit for makers with Down syndrome

Noor Rinkes
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PREFACE

Growing up close to my aunt, I have always seen how capable she and others like her truly are. I have also seen how often that capability goes unnoticed. How quickly people assume people with Down syndrome cannot do something before they have even had the chance to try. That gap between what they are capable of and what the world expects of them is something I have thought about for a while. When I came across the Design for DIY framework and its vision of democratising design, I immediately saw that gap reflected in it. The framework promised to make making accessible to everyone, but it had never been designed for people with a cognitive disability or other disability in mind. That is what I wanted to change.

I wanted to find out what happens when you design for DIY differently. Not by lowering the bar or simplifying the task, but by rethinking the tools, the instructions and the environment so that the barrier disappears entirely. What I found, across two rounds of testing with young adults with Down syndrome, is that when the design is right, the capability was always there.

This thesis is for my aunt and for the participants who showed me that capability. And for every designer who has not yet considered who they are designing for, and who they are not.

ACKNOWLEDGEMENTS

This project would not have been possible without the people who gave their time, knowledge and enthusiasm to it.

First, I want to thank my chair Jan Willem and my mentor Gerard for their guidance throughout this project. Their feedback pushed me to think beyond and from different angles and I am grateful for the conversations we had.

I want to thank Alez Academie, UPClub and Stichting Downsyndroom for opening their doors to me, sharing their expertise and connecting me with the people this project is about. The teachers who were present during the testing sessions, for their patience, their observations and their trust in letting me work with their students.

Most of all I want to thank the participants. You were kind, funny, creative and genuinely inspiring. You made every session something I will look back on with a lot of joy. The cards you sent me the week after our session are something I will keep for a long time.

Finally, I want to thank my parents for supporting me throughout my studies and in life. None of this would have been possible without you.

EXECUTIVE SUMMARY

This thesis explores how the Design for Do-It-Yourself (DfDIY) framework can be adapted to develop a toolkit that facilitates independence, skill acquisition and fosters a sense of pride of authorship for young adults with Down syndrome, advancing the democratisation of design.

The DfDIY framework, developed by Hoftijzer (2024), argues that designers should shift from creators of finished products to facilitators who enable others to make, modify and take ownership of what they build. However, the framework implicitly assumes a 'layperson' with neurotypical cognitive abilities and standard physical dexterity. This restricts the participation of people with intellectual disabilities in maker environments. This project identifies that gap and addresses it through the development of an inclusive DfDIY buildkit specifically designed for young adults with Down syndrome.

A literature review across five sub-research questions examined the current state of DIY for people with intellectual disabilities, the physical and cognitive barriers specific to Down syndrome, relevant pedagogical frameworks from special education, the concept of pride of authorship for this demographic and methods for evaluating toolkit effectiveness. The findings informed a set of eighteen design guidelines for an inclusive DfDIY toolkit, covering accessible components, embedded and visual instructions, scaffolded independence, errorless learning, co-creation through tangible choice systems and aesthetic scaffolding.

These findings were translated into a set of requirements and design guidelines that informed the development of Down to Make. Down to make is a brand that develops buildkits for young adults with Down syndrome, each enabling users to independently learn new cognitive or physical making skills, experience a sense of pride of authorship and participate as active makers in the design process. The screen-printing kit described in this thesis is the first kit in the Down to Make range and served as the case study through which the core methodology was developed and tested. The kit includes a layered instructional system combining a full instructional video, a laminated step-by-step booklet and physical cues embedded directly into the components. A colour-coded choice card system placed on a placemat gives users creative agency over what they make, what colour they use and what design they print. The kit was developed by research through design, an expert review and two rounds of user testing with fifteen young adults with Down syndrome aged seventeen to twenty-five.

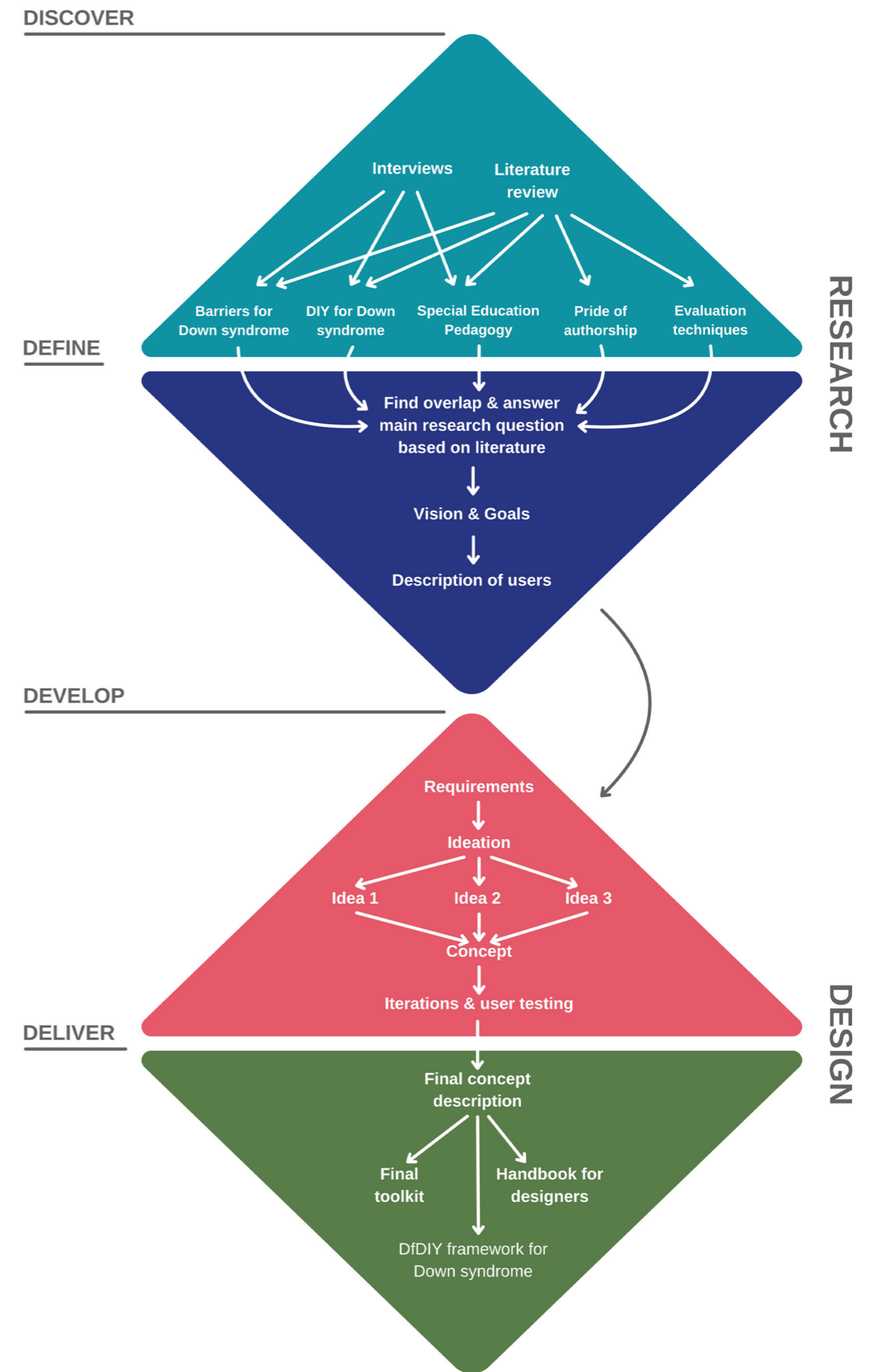
The testing confirmed that when the instructional system, physical components and choice architecture are designed to remove barriers rather than compensate for them, participants engage independently with a (complex) making task and produce results they are genuinely proud of. Facilitator interventions dropped significantly between iterations and participants consistently demonstrated more independence than their teachers and caregivers had expected. Every participant across both rounds wanted to show their finished object to someone, a clear and consistent indicator of pride of authorship.

The thesis concludes with a set of thirty-eight design guidelines for future designers who want to develop similar kits, covering activity selection, kit design, facilitation and evaluation. These guidelines are intended to be applicable across a wide range of making techniques and to serve as a starting point for extending the democracy of design to people with Down syndrome and possibly other cognitive disabilities.

APPROACH

The approach for his project is structured around the Double Diamond method (Design Council, 2003), which divides the design process into four categories: Discover, Define, Develop and Deliver. The first phases two form the Research phase and foundation of this project. This stage is dedicated to understanding the problem space and defining project objectives. This is described in chapters 1 to 8. Following this, the project flows into the Design phase, chapters 9 to 17. This phase consists of the develop and deliver phase. In the develop phase multiple ideas were thought of, considered and tested. The deliver phase presents the final outcome of the project and provides a discussion, conclusion, recommendations and reflection.

The following image provides a detailed overview of the specific steps taken within each of these phases.



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DISCOVER

Introduction

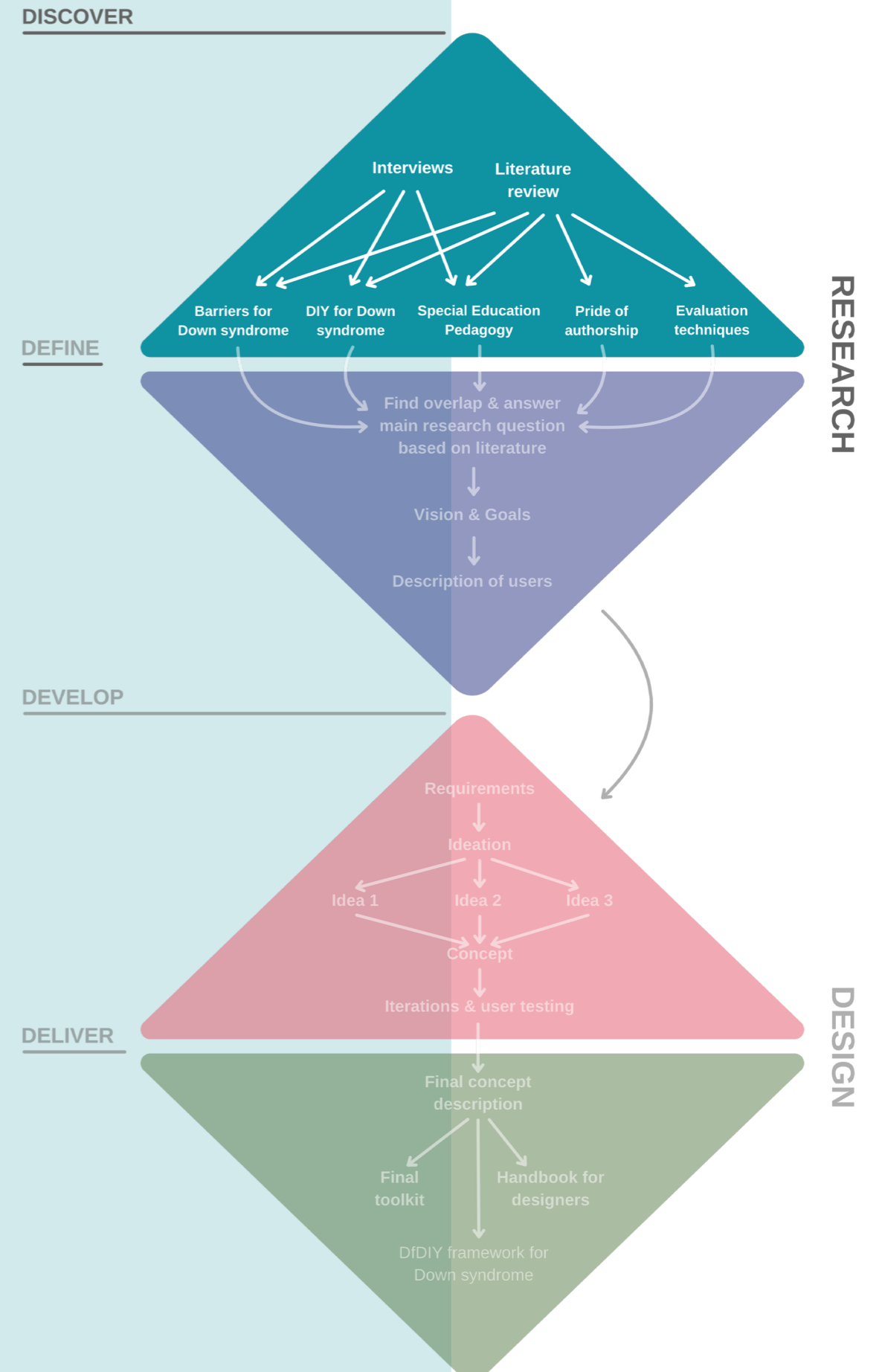
Background information on the project is given

Vision and Research Questions

Vision for the project and research questions are defined

Answers to Sub-Research Questions

Per chapter, the answer to one sub-question is given



1. INTRODUCTION 2. CONTEXT

The industrialisation of society has fundamentally altered the human relationship with objects, driving a wedge between the sphere of production and the sphere of consumption. This “bifurcation” has fostered a culture of passive consumerism, resulting in alienation where individuals are disconnected from the origins, materials, and repair of the products they use. In response to this unsustainable trajectory, Hoftijzer (2024) proposes a paradigm shift towards “Design for Do-It-Yourself” (DfDIY). This approach redefines the designer’s role from a creator of finished goods to a facilitator who provides the systems, toolkits, and platforms necessary for ‘laypersons’ to become active makers. By engaging in the creative process and having an influence on the design of a product, users transition from passive consumers to active participants, fostering sustainability through product attachment, generating a profound “pride of authorship” and democratising design (Hoftijzer, 2024).

However, a critical gap exists within the current discourse on DfDIY. Whilst the framework advocates for the democratisation of design, it implicitly assumes a “layperson” (as described by Hoftijzer (2024), de Waard (2014), Perdeck (2015) and Sypesteyn (2014)) with neurotypical cognitive abilities and standard physical dexterity. This is a natural consequence of the framework’s general scope rather than an explicit exclusion. Consequently, Johnstone et al. highlight that traditional makerspaces often present physical, cognitive and social accessibility barriers, which restrict the participation of people with intellectual disabilities in maker environments. Thus causing marginalisation.

Down syndrome is a genetic condition resulting from an extra copy of chromosome 21, meaning an individual has 47 chromosomes instead of the typical 46 (Cosentino et al., 2021). This extra chromosome alters how a child’s body and brain mature. Consequently, it can result in developmental delays, intellectual challenges, and a higher likelihood of specific medical conditions. It affects roughly 1 in 700 children, making it the most common genetic cause of intellectual disability. Whilst most individuals experience mild to moderate cognitive challenges, those with mild disabilities often achieve significant independence, such as holding jobs or travelling alone. Conversely, those with moderate disabilities typically require more ongoing support (K. Ellis et al., 2021). Recent research also shows that cognitive ability in Down syndrome is not uniform. Onnivello et al. (2022) identified three distinct cognitive subgroups, one displaying the “typical” Down syndrome profile with stronger non-verbal than verbal skills, a second group with comparatively stronger verbal abilities, and a third, higher-performing group with balanced verbal and non-verbal skills. These findings highlight the considerable heterogeneity within Down syndrome and emphasise the importance of tailored educational and support strategies.

Despite challenges like shorter attention spans, impulsive behaviour, or delayed speech, many children with Down syndrome possess significant strengths. They often have excellent social skills and are capable of connecting non-verbally from infancy. They also tend to be strong visual learners who thrive when taught through pictures or demonstrations (Boston Children’s Hospital, n.d.). Although physical milestones may be reached later than those of their peers, children with Down syndrome eventually master these skills. Special education plays a vital role in their success by tailoring learning methods to fit their unique strengths (Global Down syndrome Foundation, 2024).

Yet, despite these capabilities, (young) adults with Down syndrome face significant societal barriers to being taken seriously. Christoff (2019) characterises this dynamic as ‘epistemic injustice,’ where individuals with cognitive disabilities are presumed incompetent, resulting in their voices being dismissed and their moral agency undermined (Christoff, 2019). This marginalisation is further evidenced in recent reviews of community participation, which indicate that whilst these individuals are physically present in society, they are often socially excluded from meaningful engagement, limiting their role to that of observers rather than active citizens (Lee et al., 2025).

This marginalisation is further evidenced by a study conducted by Stichting Downsyndroom (2014) involving 111 young adults (13 years or older). Adults with Down syndrome often feel marginalised and excluded from society. According to the study, at least 95% of the participants feel ignored or avoided by their peers, 40% feel discriminated against, and almost 100% feel undervalued or underestimated by society. These numbers correlate with what a teacher at Alez Academie in the Netherlands stated in an interview. The students with Down syndrome are severely underestimated by society and therefore marginalised from many different activities. Furthermore, 65% of the parents interviewed state that their child does not feel accepted, which goes hand in hand with the parents’ feeling that their child is underestimated.

The study also explores what people with Down syndrome do in their spare time and how they wish to spend it. Nearly all participants mention they want to do something useful with their free time, and almost 75% report that they love being creative. These activities involve drawing, painting, music, dance, puzzles, and reading stories. These numbers suggest that the door to the ‘maker world’ is not closed because of a lack of talent, but because people wrongly assume they are not capable of joining in (De Graaf, 2018). Interestingly, the finding that nearly 75% of young adults with Down syndrome enjoy creative activities aligns closely with trends in the general population. Surveys amongst American adults show that up to 75% of Americans describe themselves as loving creative activities. This suggests that the creative interests of people with Down syndrome are not an exception but rather mirror broader societal patterns. The barrier to participation in the maker world, therefore, does not stem from a lack of interest or talent but from societal underestimation and exclusion (Mosher, 2024).

Organisations like Alez Academie and UPClub in the Netherlands are already striving to break the barrier of underestimation by giving students with Down syndrome the opportunity to further develop their skills after Secondary Special Needs Education (VSO (Voortgezet Speciaal Onderwijs) or ZML (Zeer Moeilijk Lerenden Onderwijs) in Dutch) by actively challenging them. That is the best way for the group to learn according to these two organisations.

Yet, within traditional care models, this demographic is often pushed off to the role of passive recipient rather than active creator, denying them the opportunity to acquire complex skills and experience the psychological benefits of self-sufficiency and creative expression (Darling & Circo, 2015; Bayor et al., 2021). If the goal of DfDIY is to bridge the gap between user and product and democratise design, it must address the specific barriers that prevent these specific groups of the population from crossing that bridge.

“Are people with Down syndrome often underestimated?”
“Yes. Always. Every day.”
- Alez Academie

3. VISION

Taking the aforementioned into consideration, a future vision was constructed. The vision reads as follows:

“A future where the concept of ‘design democracy’ is extended to everyone, where designers empower both neurotypical and neurodiverse individuals to move from passive consumers to active makers, fostering independence through skill acquisition and a profound sense of pride of authorship.”

4. RESEARCH QUESTIONS

To gather insights in this future and to help get there, research needs to be done guided by the following question:

“How can the ‘Design for DIY framework’ be adapted to develop a toolkit that facilitates independence, skill acquisition and fosters a sense of pride for people with cognitive disabilities, focusing on (young) adults with Down syndrome, to advance the democratisation of design?”

To move in this direction, the question will be researched using the following sub-questions :

1. What has been done previously in the field of DIY for this specific demographic and how can this be incorporated into a toolkit for the target group using DIY?
2. What are the specific cognitive and physical barriers for people with Down syndrome that are also inherent in current DIY practices, and how are these barriers currently being addressed in the design of products intended for this user group (if addressed at all)?
3. Which pedagogical features derived from special education research can be synthesised into an inclusive DfDIY toolkit design to support skill-building, reduce cognitive load, and promote independence and democracy in design?
4. Does the concept of ‘pride of authorship’ manifest differently for this specific demographic than neurotypicals, if so, how can we understand the unique emotional value of making to inform designs that emphasise user competence and mediate societal perception?
5. “How can the effectiveness of the developed toolkit be evaluated to ensure it meaningfully enhances skill acquisition, pride of authorship, independence and design democracy within the target group?”

This research explores the intersection of DfDIY, inclusive design, and pedagogy. It aims to dive deeper into the DfDIY framework and how it can be adapted to create toolkits that not only facilitate skill acquisition and foster a sense of pride for people with Down syndrome but also extend the democratisation of design.

5.1. DIY FOR COGNITIVE DISABILITIES & CO-CREATION

“What has been done previously in the field of DIY for this specific demographic and how can this be incorporated into a toolkit for the target group using DIY?”

The current field of DIY for people with intellectual disabilities

The involvement of people with intellectual disabilities in the maker movement has been restricted to simple and repetitive crafts such as, bead-stringing, colouring pre-drawn templates or gluing pre-cut shapes. This reinforces the misconception that complex fabrication is beyond their reach. When in fact this demographic should be challenged and stimulated constantly to further their educational development. To support this, a growing body of research is dismantling the assumption of simple and repetitive crafts, proving that when we strip away physical barriers, the “capability gap” disappears. A prime example is the TapeBlocks toolkit (K. Ellis et al., 2021), which replaced delicate electrical wires with chunky, conductive foam blocks, allowing users to build functional circuits without needing fine motor dexterity. Similarly, the study “Piece it Together” (K. Ellis et al., 2023) demonstrated that with the right “scaffolding” (support that is gradually removed as skills grow) (young) adults with intellectual disabilities can master sophisticated skills like programming and electronics. These findings are critical because they shift the “blame” for exclusion away from the user’s disability and onto the design of the tools themselves, proving that high-level making is accessible when the system is designed to include them.



Figure 1: TapeBlocks toolkit (K. Ellis et al., 2021).

Co-Design with people with intellectual disabilities

How we invite these users into the creative process presents a unique challenge. Researchers have already looked at how to co-design with people with disabilities, revealing that the standard “toolkit” of design workshops is often inadequate (Labattaglia et al., 2023). Experiences of co-design stakeholders were examined and found that without specific support structures to facilitate communication, the co-design process frequently breaks down. This is largely because traditional co-design relies heavily on abstract brainstorming (“What would you like to build?”), which can be exclusionary for neurodivergent thinkers who thrive on the concrete (Aswad et al., 2022). To bridge this gap, Safari et al. (2024) argue that facilitators must act as “translators,” converting abstract questions into physical choices (Safari et al., 2024). This “tangible turn” is best exemplified by the COBO study (2021), which replaced sketching with a card-based system, allowing participants to “build” their preferences using cards with textures and images. By moving from abstract talk to tangible action, we can ensure that their contribution is not just tokenistic, but a genuine expression of their creative will (Cosentino et al., 2021).

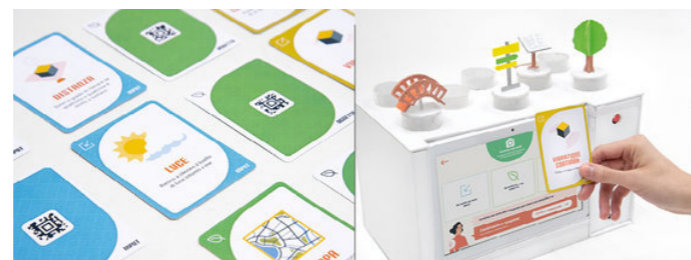


Figure 2: COBO study (Cosentino et al., 2021).

Findings from semi-structured interview

Stichting Downsyndroom has implemented a similar approach to help teenagers and young adults with Down syndrome engage with both complex and general topics. For this demographic, dialogue is facilitated by providing sufficient processing space and asking targeted questions. To this end, the organisation developed a set of ‘conversation cards’ (praatkaarten) that empower individuals to select the topics they wish to discuss. Regarding these aids, Stichting Downsyndroom states: “Young adults with Down syndrome can be greatly assisted when provided with visual aids. These cards can help them articulate their thoughts. In this way, the young adults gain more insight into what they find important, what they are good at, and what they find difficult.” (Handige Brochures, n.d.).

Collaborative mindset

Lastly, Hedditch and Vyas (2025) propose that a methodological shift is needed. Moving from a solitary “Do-It-Yourself” (DIY) model to a collaborative “Do-It-Together” (DIT) mindset. Hedditch and Vyas (2025) argue that for marginalised groups, the goal should not be total autonomy, which can lead to isolation, but rather interdependence, where skills are pooled within a community. This approach directly challenges the “epistemic injustice” described by Christoff (2019), where society assumes people with cognitive disabilities have nothing valuable to contribute (Christoff, 2019). By reframing the maker space as a site of collaboration, we contribute to changing the view of people with Down syndrome as passive recipients of care and start taking them seriously as active, competent contributors to the designed world.

“The way people treat those with Down’s syndrome, how condescending they are. I notice it every day and think: how on earth could you even think that?” - Alez Academie

5.1.1. ANSWER SUB-RESEARCH QUESTION 1

Prior work shows that accessible toolkits (e.g., TapeBlocks, Piece It Together) and tangible co-design methods (card systems, conversation cards) enable people with intellectual disabilities to participate in complex making. The toolkit should therefore combine accessible components with a tangible co-creation process that uses physical choice-points.

Evidence

Previous research into DIY for people with intellectual disabilities has shifted the focus from the user's limitations to the design of the tools and toolkit themselves. Projects like TapeBlocks (2021) and "Piece it Together" (2023) have demonstrated that when physical barriers, such as delicate wiring, are replaced with accessible alternatives like conductive foam and tape, the 'capability gap' disappears. By using 'scaffolding', which is support that is gradually removed as skills grow, the demographic can master sophisticated tasks in for example electronics and programming, that were previously considered beyond their reach.

To incorporate these findings into a co-creation toolkit, the design process must move away from abstract brainstorming toward a 'tangible turn'. Because traditional co-design can be exclusionary for neurodivergent thinkers, facilitators should act as 'translators', converting abstract questions into physical choices. This is shown in the COBO study (2021) and Stichting Downsyndroom's use of texture cards, visual aids and conversation cards, which allow participants to 'build' or select their preferences through concrete action rather than verbal abstraction.

Implication for the toolkit

In practice, this means the toolkit must include:

- » Accessible components that remove the need for fine motor dexterity.
- » Physical communication aids (like conversation cards) to ensure actual creative input.
- » A scaffolding framework that empowers users to become active, independent contributors. By embedding a Do-It-Together mindset in the toolkit's initial steps, the framework supports users to practise skills with guided help and progressively take on tasks independently, ultimately fostering confidence and autonomy.

5.2. IDENTIFYING BARRIERS IN DIY FOR DOWN SYNDROME

“What are the specific cognitive and physical barriers for people with Down syndrome that are also inherent in current DIY practices, and how are these barriers currently being addressed in the design of products intended for this user group (if addressed at all)?”

To understand how (young) adults with Down syndrome can be more fully included in the maker movement, we must first recognise that standard DIY tools and practices are designed around a “normative” user profile, one that assumes average muscle tone, dexterity, and executive function. This creates an ergonomic mismatch in which the tools, rather than the users, become the limiting factor. As highlighted in a paper by Leisman et al. (2020), standard workplaces and tools frequently fail to account for the unique anthropometric and neurological needs of this demographic, creating physical barriers that are often mistaken for a lack of capability (Leisman & Israely, 2020).

Physical barriers & findings from semi-structured interview

The primary physical barrier stems from the specific motor profile associated with Down syndrome. Will and Roberts (2021) identify hypotonia (low muscle tone) and ligamentous laxity (loose joints) as inherent traits that make stabilising standard tools difficult. This is further complicated by the demand for “precision grip” (pinching small objects) in most DIY tasks (Will & Roberts, 2021). Dick (2025) notes that while users may possess strong “power grips,” current tools require fine motor manipulation that causes fatigue and frustration (Dick, 2025). An interview with an expert researcher at Stichting Downsyndroom further highlighted that the primary physical barriers for individuals with this condition generally include shorter stature, limited fine motor skills, and speech difficulties. To mitigate these challenges, environments should be modified to avoid placing items at height or requiring overly precise manual tasks. Since auditory information may not be easily retained, communication should be heavily supported by visual aids, such as photographs and videos. It is also essential to allow sufficient time for individuals to process and answer questions. While literacy should be utilised

where applicable, written instructions must remain simple and accessible without becoming patronising or childlike. Further research suggests that these physical deficits are not impossible to overcome. The study by Maria et al. (2019) demonstrates that motor performance is deeply linked to visual processing. It argues that when users are provided with strong visual cues and adapted aids, their motor accuracy improves significantly. This suggests that the “clumsiness” often observed is not just a motor issue, but a design failure, a lack of visual scaffolding to guide the hand (Maria et al., 2019).

“Make sure information or instructions are clear and simple but do not make it condescending, patronising or too child-like.” - Stichting Downsyndroom

Cognitive barriers

Beyond the physical, users face significant invisible barriers related to cognitive load and executive function. Kennedy and Romig (2021) apply Cognitive Load Theory to explain that individuals with intellectual disabilities often have a reduced working memory capacity. Traditional DIY instructions, which require holding multiple steps in one’s head (e.g., “measure, mark, cut, then glue”), generate “extraneous cognitive load” that overwhelms the user before they begin. Deficits in executive function further complicate this issue. Specifically in planning and sequencing (Kennedy & Romig, 2021). As noted in the study by Johnstone (2024), the challenge is often not the task itself (e.g., cutting wood), but the “invisible labour” of organising the steps to get there. Without external aids to externalise this planning process, the user remains dependent on a caregiver to direct their every move (M. E. Johnstone, 2024).

DIY environment

Many individuals in this demographic experience heightened sensitivity to noise, movement, and unpredictability, meaning that typical makerspaces, often loud, visually cluttered,

and chaotic, can easily overwhelm their sensory processing systems. When this happens, anxiety and disengagement are natural responses, not signs of disinterest (BCLA, 2025).

Similarly, safety concerns arise not because users are inherently incapable, but because standard tools and electronics are designed around assumptions of fine motor precision and rapid response. Hot soldering irons, sharp pins, and exposed wiring introduce risks that caregivers understandably try to mitigate. However, this protective instinct often results in restricted access, unintentionally reinforcing a passive role (K. Ellis et al., 2021).

Seen from this alternative perspective, the issue is not that people with Down syndrome “cannot handle” DIY environments, but that these environments are not yet designed to support their sensory, cognitive, and motor needs. A truly inclusive DfDIY toolkit must therefore create conditions where exploration feels safe, predictable, and manageable, reducing sensory overload, embedding safety into the tools themselves, and enabling independent engagement without constant supervision.

Current design interventions for people with an intellectual disability and low muscle tone

In response to these barriers, the field has shifted from simply “simplifying” tasks to using advanced technology to scaffold the user’s experience. A challenge identified in this shift is the instruction-to-action gap: the cognitive leap required to translate an instruction (“tighten the screw on the left”) into the correct physical action in the real world. For many (young) adults with intellectual disabilities, this gap is widened by difficulties with working memory, spatial reasoning, and multi-step planning, meaning that even well-designed instructions can fail if they remain abstract or detached from the physical task at hand (Kennedy & Romig, 2021).

The most prominent solution for the instruction to action gap is Augmented Reality (AR). Recent studies, such as those by Vanneste et al. (2020) and Bryant and Hemsley (2022), demonstrate that AR is superior to paper manuals for users with intellectual disabilities. By overlaying holographic arrows or “ghost” images directly onto the physical object, AR removes the need for abstract translation (looking at a 2D manual and mapping it to a 3D object). This “situated scaffolding” directly addresses the executive function barrier by breaking complex tasks into single, immediate prompts (Vanneste et al., 2020), (Bryant & Hemsley, 2022). On top of that, to counter the executive function deficits, researchers have introduced the “scaffold” framework (2021),

which dictates that maker activities must include “fail-safe” mechanisms and “chunked” information (Seo & Richard, 2021).

To tackle the barrier of “engagement” and “fear of failure,” designers are employing Serious Games and gamification. Developing frameworks like Risk Resist and EnCity use game mechanics (points, levels, immediate feedback) to teach life skills. Risk Resist uses game-based scenarios to help users practise safe decision-making under pressure, while EnCity simulates everyday urban challenges to build problem-solving and independent-living skills. In a DIY context, this “gamified” approach transforms a stressful fabrication task into a low-stakes “mission,” effectively lowering the anxiety barrier associated with learning new tools (Shohieb et al., 2025), (Bourazeri et al., 2017).

On the hardware side, the solution has largely been “Bespoke DIY-AT” (Do-It-Yourself Assistive Technology). This concept is about modifying standard tools (like a normal screwdriver or saw) with cheap, custom-made plastic parts so that someone with low muscle tone or poor grip can use them safely. As described in Bespoke Reflections (2020), the current trend is to use 3D printing to create custom “jigs” or “add-ons”, such as a custom handle for a saw or a guard for a soldering iron, that adapt a standard tool to a specific user’s hand. This moves away from buying “special” tools and towards modifying “normal” tools to be inclusive (K. Ellis et al., 2020).

The current landscape of accessibility-focused product design reveals a notable imbalance: only a small number of products are created specifically for people with Down syndrome, while a much larger set of solutions addresses the underlying motor and cognitive characteristics associated with the condition, such as low muscle tone, reduced grip strength, joint laxity, and increased cognitive load. The products identified across these categories demonstrate how designers employ strategies such as grip enlargement, tactile differentiation, colour-coding, anti-slip surfaces, and visual structuring to reduce both physical and cognitive demands. However, these solutions remain fragmented across everyday living aids, kitchen tools, educational materials, and maker-oriented adaptations, with very few designed to support creative autonomy or hands-on making. This fragmentation highlights a clear design opportunity: the development of a toolkit that enables people with Down syndrome to participate more independently and confidently in DIY and maker activities. The table below summarises the current landscape: the first products are designed specifically for people with Down syndrome, while the others address low muscle tone or extraneous cognitive load more broadly.













PRODUCT	IMAGE	WHAT IS IT + PURPOSE	SOURCE
Xtra Apparel – Adaptive Clothing		Clothing designed around DS body proportions.	https://xtraapparel.com
Ella Westlund – Inclusive Furniture		Soft, sensory-friendly furniture inspired by her sister with DS. Encourages social closeness and reduces physical barriers.	https://ellawestlund.se
See and Learn (DSEI)		Physical learning materials tailored to DS cognitive profiles. Supports literacy, speech, and structured learning.	https://www.dseinternational.org
OXO Good Grips Range/Built-Up Handle Cutlery		Kitchen tools and cutlery with enlarged, soft handles. Compensates for weak grip.	https://www.oxo.com
EazyHold Universal Cuff		Silicone cuff for utensils, pens, brushes. Enables independent eating, writing, and brushing.	https://eazyhold.com
Foam Grip Tubing		Foam tubes that enlarge handles. Compensates for weak grip.	https://www.amazon.com/foam-grip/s?k=foam+grip
Loop Scissors (Self-Opening)		Scissors that spring open automatically. Reduces hand fatigue and required strength. Supports limited fine motor control.	Peta Easi grip
Colour-Coded Kitchen Tools		Tools grouped by colour per task. Simplifies sequencing and identification.	https://ceonline.co.uk/
Time timer		Visual countdown timer. Reduces time-related cognitive load.	https://www.timetimer.com/
Pictogram Schedules (Pictobello, PictoPlanner)		Physical visual planning tools. Reduces working memory demands.	https://pictobello.nl/
One-way assembly jigs		Jigs that allow only correct assembly. Reduces cognitive load and prevents errors.	https://oneway.ca/products-category/sharpening-grinding-jigs/Grinding%20Jig + maker community
STEM build kits (crunch labs)		Build boxes for children to teach them difficult STEM topics/theories	https://www.crunchlabs.com/

Figure 3: The table illustrates the current landscape of products designed for people with Down syndrome, a cognitive or physical disability.

5.2.1. ANSWER SUB-RESEARCH QUESTION 2

People with Down syndrome face motor (hypotonia, poor precision grip) and cognitive (reduced working memory, sequencing) barriers; current solutions address these with ergonomic adaptations, embedded visual scaffolds, AR-based step prompts, and error-preventing hardware.

- by using AR instructions or by making instructions in a way that is directly applicable to a 3D environment
- » Create a safe environment that allows for independent exploration without constant caregiver supervision.

Evidence

Standard DIY practices are designed for a “normative” user, creating an “ergonomic mismatch” for people with Down syndrome. Physical barriers include hypotonia (low muscle tone) and ligamentous laxity (loose joints), which make stabilising tools difficult. While these users often have strong “power grips,” they struggle with the “precision grips” required for small components. Furthermore, cognitive barriers such as reduced working memory and executive function deficits make the “invisible labour” of planning and sequencing tasks, like measuring and cutting in order, overwhelming without external aids. Additionally, shorter stature and speech difficulties can hinder interaction with standard-height workspaces and traditional verbal instruction.

Current design interventions address these hurdles through “situated scaffolding” and hardware modifications. Augmented Reality (AR) is increasingly used to overlay holographic instructions directly onto physical objects, removing the need for users to translate 2D manuals into 3D actions. On the hardware side, Bespoke DIY-AT uses 3D printing to create custom “jigs” or handles for standard tools, allowing users with limited fine motor skills to work safely and effectively. Additionally, gamification is used to transform stressful fabrication tasks into low-stakes “missions,” reducing the anxiety and sensory overload often found in loud maker environments.

Implication for the toolkit

To translate these findings into a toolkit for this target group, the following elements should be incorporated:

- » Replace text-heavy instructions with visual cues, like photographs and videos, and simpler language without becoming childlike or patronising.
- » The toolkit must be accessible by making sure that fine motor skills are not needed.
- » Allow individuals sufficient time to process instructions and answer questions.
- » Externalise the planning process to reduce cognitive load

5.3. INTEGRATING SPECIAL EDUCATION PEDAGOGY INTO DfDIY TOOLKITS

“Which pedagogical features derived from special education research can be synthesised into an inclusive DfDIY toolkit design to support skill-building, reduce cognitive load, and promote independence and democracy in design?”

Pedagogical frameworks & findings from semi-structured interview

In the context of adult education for individuals with intellectual disabilities, independence is fundamentally linked to the management of working memory. Kennedy and Romig (2021) apply Cognitive Load Theory (CLT) to demonstrate that “extraneous cognitive load”, mental effort wasted on processing complex or disorganised information, is a primary barrier to autonomous action (Kennedy & Romig, 2021). Research indicates that individuals with Down syndrome often experience specific deficits in executive function, particularly in working memory and sequencing (M. E. Johnstone, 2024). A teacher at Alez Academie also mentioned problems with planning and organisation amongst the demographic. Consequently, reliance on external caregivers often comes not from a lack of motor capability, but from the inability to hold multiple abstract instructions in memory simultaneously. The Scaffold framework addresses this by categorising “Organisation” and “Simplicity” as essential pedagogical requirements. The study suggests that when instructional guidance is embedded directly into the environment or task structure (reducing the split-attention effect), the need for human intervention decreases, thereby facilitating greater independence. “Embedded instruction”, can also be seen as “use cues”, is a pedagogical feature where the guidance is physically integrated into the tool itself (e.g., a handle that only fits the hand one way, or colour-coded parts) (Seo & Richard, 2021).

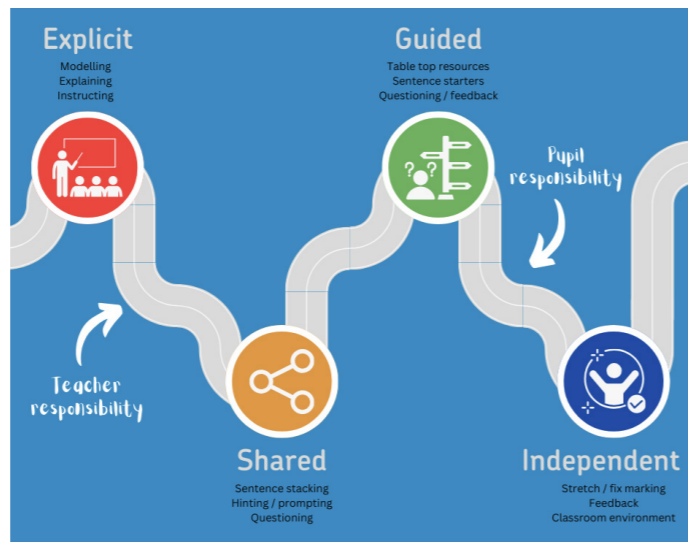


Figure 4: The Scaffolding framework (Testbasedev, 2024).

Effective skill-building for this demographic is supported by specific pedagogical strategies rather than rote repetition, which relies on mechanical repetition without meaningful understanding of the job at hand. The Universal Design for Learning (UDL) framework posits that learners with diverse cognitive profiles require “Multiple Means of Representation”. This principle suggests that retention improves when information is presented redundantly, (giving the exact same instruction in multiple formats at the same time) simultaneously engaging visual, tactile, and symbolic processing systems (Marino et al., 2024). A teacher at Alez Academie and UPClub mentioned that students with Down syndrome also learn best when they see instructions or an example and have to recreate that as their visual skills are much better than their auditive skills. Research on Errorless Learning shows that (young) adults with intellectual disabilities acquire vocational and manual skills most effectively when early mistakes are minimised. By preventing errors before they occur, this approach protects the learner’s sense of self-efficacy, a construct that Shogren et al. (2019) identify as central to long-term engagement and skill retention.

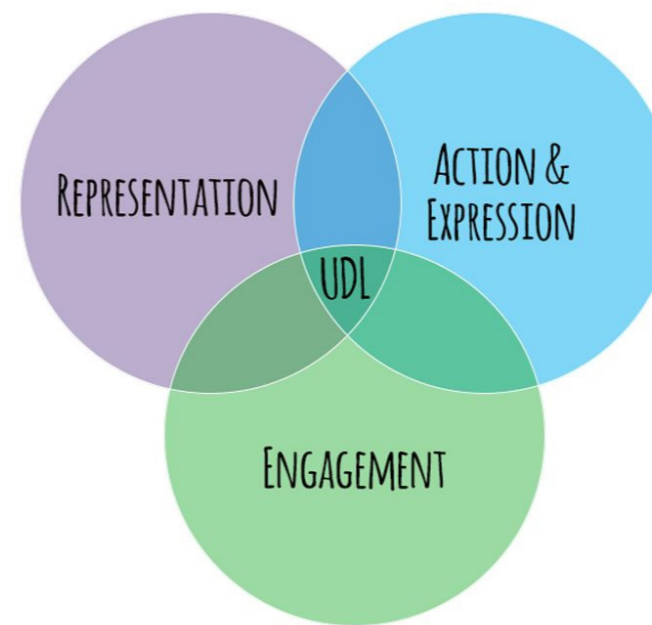


Figure 5: Universal Design for Learning framework (Carleton College, 2022).

In disability studies, the notion of “democracy” encompasses more than just involvement, it also incorporates elements of Self-Determination Theory (SDT). Shogren et al. (2021) identify autonomy, the ability to act according to one’s own will, as a fundamental psychological need. In educational and vocational settings, a distinction is drawn between “compliance” (following instructions to produce a fixed outcome) and “volition” (making choices about what to create) (Shogren et al., 2021). Fraser-Barbour et al. (2023) argue that traditional models of care often operate on a “paternalistic” basis, where decision-making power resides with the facilitator (Fraser-Barbour et al., 2023). In contrast, frameworks based on “Lived Expertise” posit that true democratic participation requires the individual to have agency over the creative process itself. This literature suggests that for an environment to be truly democratic, it must support “Open-Ended” activities where the participant exercises control over the goals and outcomes of their labour, rather than solely the execution of tasks (Clifton et al., 2025).

“He is bored by repetitive tasks and often feels ‘babied.’” - UPClub

5.3.1. ANSWER SUB-RESEARCH QUESTION 3

Pedagogical features derived from special education research that can be used in an inclusive DfDIY toolkit design to support skill-building, reduce cognitive load, and promote independence and democracy in design are a combination of scaffolding (gradually reduced support), Universal Design for Learning (multiple simultaneous representations), and errorless-learning to reduce extraneous cognitive load while enabling volition through staged choice.

Evidence

To foster independence, pedagogical research highlights that reducing extraneous cognitive load is more critical than motor training. Because individuals with Down syndrome often face working memory and sequencing challenges, the Scaffold framework suggests using “embedded instruction”, where guidance is built into the tool itself, such as colour-coded parts or handles that only fit one way. This physical scaffolding reduces the need for abstract memory and lessens reliance on caregivers.

Effective skill-building is further supported by Universal Design for Learning (UDL), which uses “Multiple Means of Representation” to provide the same information through visual, tactile, and symbolic channels simultaneously. To protect a user’s self-efficacy, the “Errorless Learning” approach is used to minimise early failures, ensuring the learner stays motivated. Finally, to promote democracy, the design must move beyond “compliance” (following orders) to “volition,” providing open-ended activities where the user makes genuine choices about the project’s goal and outcome.

Implication for the toolkit

To synthesise these frameworks into an inclusive toolkit, the following features could be included:

- » Make use of the scaffolding framework in combination with embedded instructions to reduce cognitive load.
- » Make use of visual instructions or physical examples for the group to follow.
- » Make use of the Universal Design for Learning (UDL) to provide the same information through visual, tactile and symbolic channels simultaneously to ensure effective skill-building.
- » Implement ‘errorless learning’ to ensure independence and self-confidence.
- » Include elements of the Self-determination theory via co-

creation, thus giving the user a say in the design of the product by giving them choices in what to create.

5.4. PRIDE OF AUTHORSHIP: EMOTIONAL VALUE & USER COMPETENCE

“Does the concept of ‘pride of authorship’ manifest differently for this specific demographic than neurotypicals, if so, how can we understand the unique emotional value of making to inform designs that emphasise user competence and mediate societal perception?”

Measuring pride of authorship, joy of the process and product fit

While “pride of authorship” is a central principle of the DfDIY framework, quantifying this emotion in a demographic with intellectual disabilities presents a challenge. Standard psychometric tools (such as numbered Likert scales) rely on abstract conceptualisation, which can be exclusionary. To address this, research suggests a multimodal measurement approach, (combining self-report and behavioural observation) is necessary to effectively address this issue.

For self-reporting, the “Gold Standard” in inclusive research is the use of Visual Analogue Scales (VAS). As outlined in a study by Watters and Orsander (2021), replacing numerical values with a spectrum of illustrative faces (ranging from “Very Sad” to “Very Happy”) allows participants to report their emotional state without requiring high-level literacy or numeracy (Watters & Orsander, 2021).

However, self-report alone is often insufficient. Behavioural research suggests that “pride” in non-verbal or less verbal populations is best observed through “Display Behaviours.” Studies on inclusive creative practice define joy and pride through physical proxies: synchronisation of movement, refusal to relinquish the object, and, most critically, the immediate impulse to show the artefact to peers. Thus, “pride” is measurable not just by what the users says, but by their “Agency of Display”, the voluntary act of claiming ownership and seeking social validation for their work (Darling & Circo, 2015).

Beyond the final result, it is critical to measure the value of the activity itself. To distinguish between compliance (“I am doing this because you told me to”) and intrinsic motivation (“I love doing this”), researchers utilise Social Validity assessments. Based on the foundational work of Wolf (1978) and recent applications by Luiselli (2021), this involves “preference assessments” where users are given a free choice between a passive leisure activity (e.g., watching a video) and the fabrication task. According to these researches, if the user consistently selects the maker activity, we have empirical proof of its intrinsic value (Wolf, 1978), (Luiselli, 2021).

Furthermore, the emotional value of the process can be quantified through “Flow” metrics. In studies of design with blind practitioners (Vermeersch et al., 2011), engagement was measured by “focus duration” and “tactile exploration time.” For (young) adults with Down syndrome, who often face challenges with sustained attention, a significant increase in “time on task” without prompts from a facilitator serves as an indicator of the “joy of making” (Vermeersch et al., 2011). On the other hand, “time on task” does not necessarily mean “joy” but it could also mean hyperfixation or confusion.

The concept of flow originates with Csikszentmihalyi (1990), who argued that deep, enjoyable engagement arises only when the challenge of an activity is matched to the individual’s skill level. Where challenge exceeds skill, the result is anxiety. Where skill exceeds challenge, the result is boredom. Sustained engagement or flow, occurs in the channel between the two. As a person’s skill grows, the challenge must grow with it to keep them there (see figure 6). This challenge-skill balance is a useful lens for this project because both failure modes appear in the interview findings: the fear of failure and hesitation described in Chapter 5.2 are signals of challenge exceeding skill, whilst the boredom and feeling of being ‘babied’ described by UPClub are signals of skill exceeding challenge. The model reframes both (challenge and skill) not as fixed traits of the user, but as challenge-skill mismatches that design can correct. It also qualifies the use of “time on task” as a metric. Extended time on task indicates flow only when challenge and skill are balanced, and may otherwise reflect confusion rather than engagement.

Rather than occupying a fixed position in this model, a toolkit for this demographic should actively regulate the challenge-skill balance for the users. Support mechanisms such as scaffolding and errorless learning lower the effective challenge of a step where it would otherwise cause anxiety, whilst creative choice and removed scaffolding raises the challenge where a repetitive task would cause boredom. Because the model dictates that challenge must rise as skill grows, it implies that support should be progressively reduced over time, a principle that could directly inform design choices (Csikszentmihalyi, 1990).

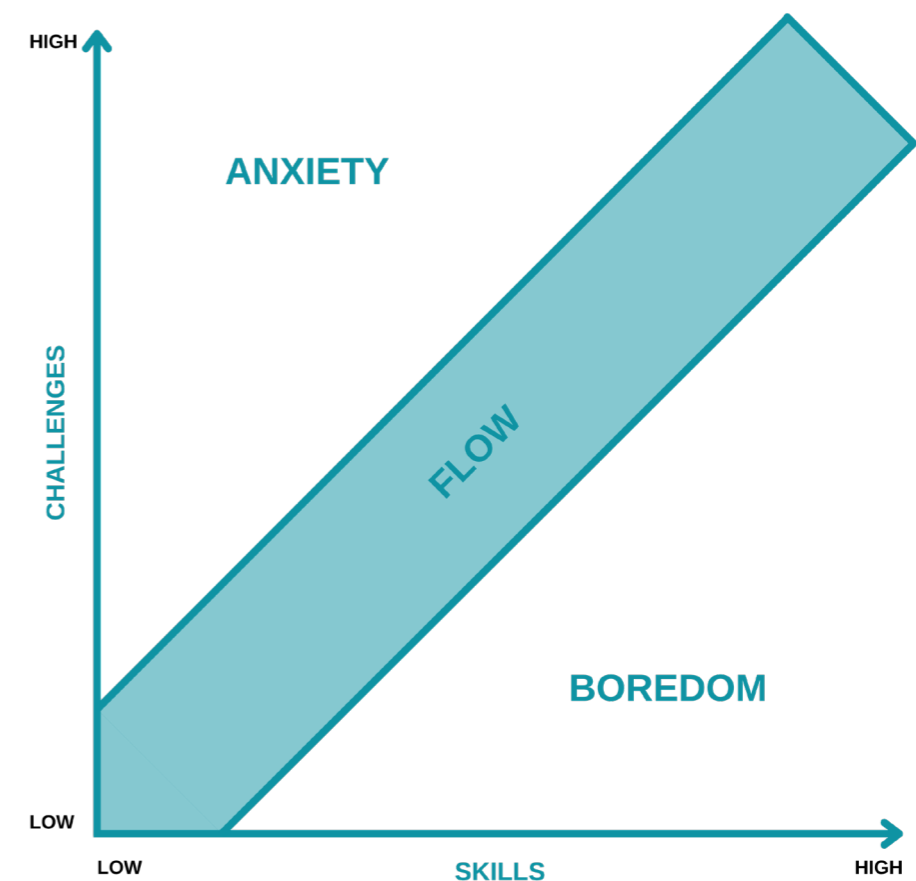


Figure 6: The challenge-skill balance model based on Csikszentmihalyi (1990).

Mediating social perception

Hola (2025) investigates the mechanisms of societal perception, describing a split in how audiences view creators with disabilities depending on their focus. When the audience's attention is directed primarily toward the person and their disability, they tend to adopt a "Medical Model" perspective, often reacting with sympathy or viewing the creative act merely as therapeutic or charitable. However, the research observes that this dynamic shifts towards an "Affirmation Model" when the audience focuses on a high-quality artefact. In these instances, the viewer recognises the skill and competence visible in the work itself, leading to a reaction of genuine respect rather than pity. This indicates that the object created acts as a critical social mediator. If the artefact communicates professional quality, it has the power to disrupt the narrative of incompetence. This finding highlights the necessity for "aesthetic scaffolding" in design. By ensuring that the final output reflects the maker's intent rather than their motor limitations, design can leverage the artefact itself to trigger the affirmation model and secure social recognition for the maker (Hola, 2025).

Ellis et al. (2020) warn against the "Stigma of Assistive Tech." Tools that look "medical" (beige plastic, oversized buttons) signal "disability" to the public. To foster social recognition, the artefact must adopt "universal design aesthetics", appearing as a sophisticated, "techy" device rather than a therapeutic aid (K. Ellis et al., 2020).

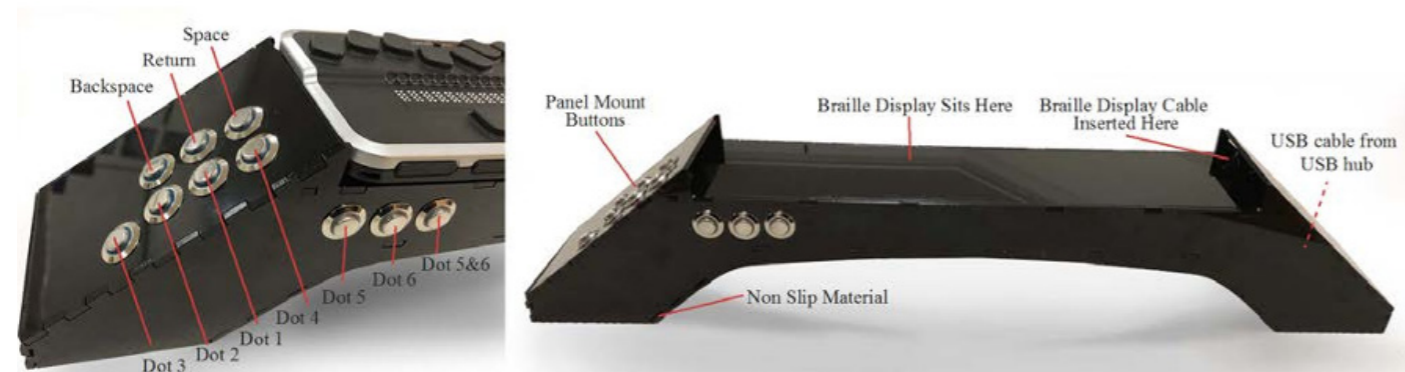


Figure 7: Example of a 'techy' product created for a blind user (K. Ellis et al., 2020).

“During work placements, for example. Workgivers are sometimes surprised and say: ‘Oh, I didn’t think they’d be able to do this yet’” - Alez Academie

5.4.1. ANSWER SUB-RESEARCH QUESTION 4

For this demographic, pride shows through agency of display (voluntary showing/claiming of work), sustained engagement, and preference for making over passive activities. On top of that, the toolkit should produce artefacts with aesthetic scaffolding so the object created by the demographic communicates competence.

Evidence

For individuals with intellectual disabilities, "pride of authorship" is manifested through Agency of Display, the voluntary act of claiming ownership and seeking social validation. Because standard numerical scales are often too abstract, pride is best measured using Visual Analogue Scales (VAS), which replace numbers with illustrative faces, and through physical "display behaviours," such as a refusal to relinquish the object or an immediate impulse to show the artefact to peers. Intrinsic motivation is further evidenced through "preference assessments," where users consistently choose making over passive activities, and through increased "time on task," indicating a state of flow and engagement.

The emotional value of making also serves as a powerful mediator of societal perception. When an audience focuses on a person's disability, they often adopt a "Medical Model" rooted in pity. However, research shows that high-quality artefacts can shift this perspective to an "Affirmation Model," where the viewer recognises genuine skill. To achieve this, toolkits must provide "aesthetic scaffolding," ensuring the final output reflects the maker's creative intent rather than their motor limitations.

Implication for the toolkit

To be able to design a toolkit that emphasises user competence, fosters social recognition the following strategies should be applied:

- » Use the aesthetic scaffolding technique by using high-quality materials and finishing techniques that ensure the final product has a professional and polished look regardless of the user's fine motor precision.
- » Avoid the "medical look" by using modern colours and sleek textures for components, ensuring they look sophisticated.
- » Use Csikszentmihalyi's challenge-skill balance as a design lens. For example: lower challenge through scaffolding where a step causes anxiety, raise it through creative freedom where a task causes boredom.

To be able to evaluate the toolkit, based on pride of authorship, skill acquisition, independence and design democracy, designed for this demographic the following strategy should be applied:

- » Use Visual Analogue Scales (VAS) in combination with agency of display and time-on task to properly evaluate if the product creates a sense of pride of authorship.

5.5. EVALUATING TOOLKIT IMPACT ON SKILL ACQUISITION, PRIDE OF AUTHORSHIP, INDEPENDENCE AND DESIGN DEMOCRACY

“How can the effectiveness of the developed toolkit be evaluated to ensure it meaningfully enhances skill acquisition, pride of authorship, independence and design democracy within the target group?”

Evaluating the effectiveness of a toolkit for individuals with Down syndrome requires a shift from standard “pass/fail” testing to methods that respect individual progress. Research suggests that Goal Attainment Scaling (GAS) is a premier framework for this demographic. GAS allows for the creation of personalised, five-point scales that measure progress towards specific, individualised goals. This is particularly effective because it captures small, incremental shifts in independence, such as moving from needing “constant physical prompts” to “independent execution”, which standard tests often overlook (Shogren et al., 2021), (Steenbeek, 2010).

Furthermore, the use of task-based cognitive tests provides a qualitative layer to evaluation. By observing response errors and behavioural patterns during the making process, researchers can identify specific “bottlenecks” in the design of the toolkit. For instance, if a user consistently struggles with a specific step, it may indicate a failure in the design of the toolkit rather than a lack of cognitive ability. This approach moves evaluation from judging the user to refining the toolkit’s design (Ertas-Spantgar et al., 2024), (Kwon & Oh, 2015).

Finally, the concept of Social Validity is needed for ensuring the toolkit’s democratic impact. This involves assessing whether the goals, procedures, and outcomes are perceived as valuable by the users themselves and their social community. By using acceptability questionnaires and preference assessments, where a user is given a choice between the toolkit and a passive leisure activity, designers can empirically measure the toolkit’s intrinsic value and its contribution to the

user’s “pride of authorship” and self-efficacy (Leif et al., 2024), (Snodgrass et al., 2023).

5.5.1. ANSWER SUB-RESEARCH QUESTION 5

To evaluate the effectiveness of the toolkit a mixed evaluation should be used combining personalised Goal Attainment Scaling (GAS), process-oriented observation to identify bottlenecks, social-validity/preference assessments, and pride metrics (VAS, agency of display, time-on-task).

Implication for toolkit assessment

To evaluate whether the toolkit meaningfully enhances skill acquisition, pride of authorship, independence and supports the democratisation of design, the evaluation phase should include:

- » Use Goal Attainment Scaling (GAS). Set individualised 5-point scales (from -2 to +2) to track progress. This ensures that even small improvements in independence or technical skill are documented.
- » Use process-oriented observation to record the making process to identify “bottleneck moments.” Focus on where the user pauses or makes errors to determine if the toolkit design needs adjusting.
- » Use social validity assessments to survey both the users and their caregivers to determine if the skills learned are perceived as useful.
- » Assess preference by observing if the participant voluntarily chooses to use the toolkit over other activities, serving as a direct indicator of engagement and intrinsic motivation.

DEFINE

Answer to Main Research Question

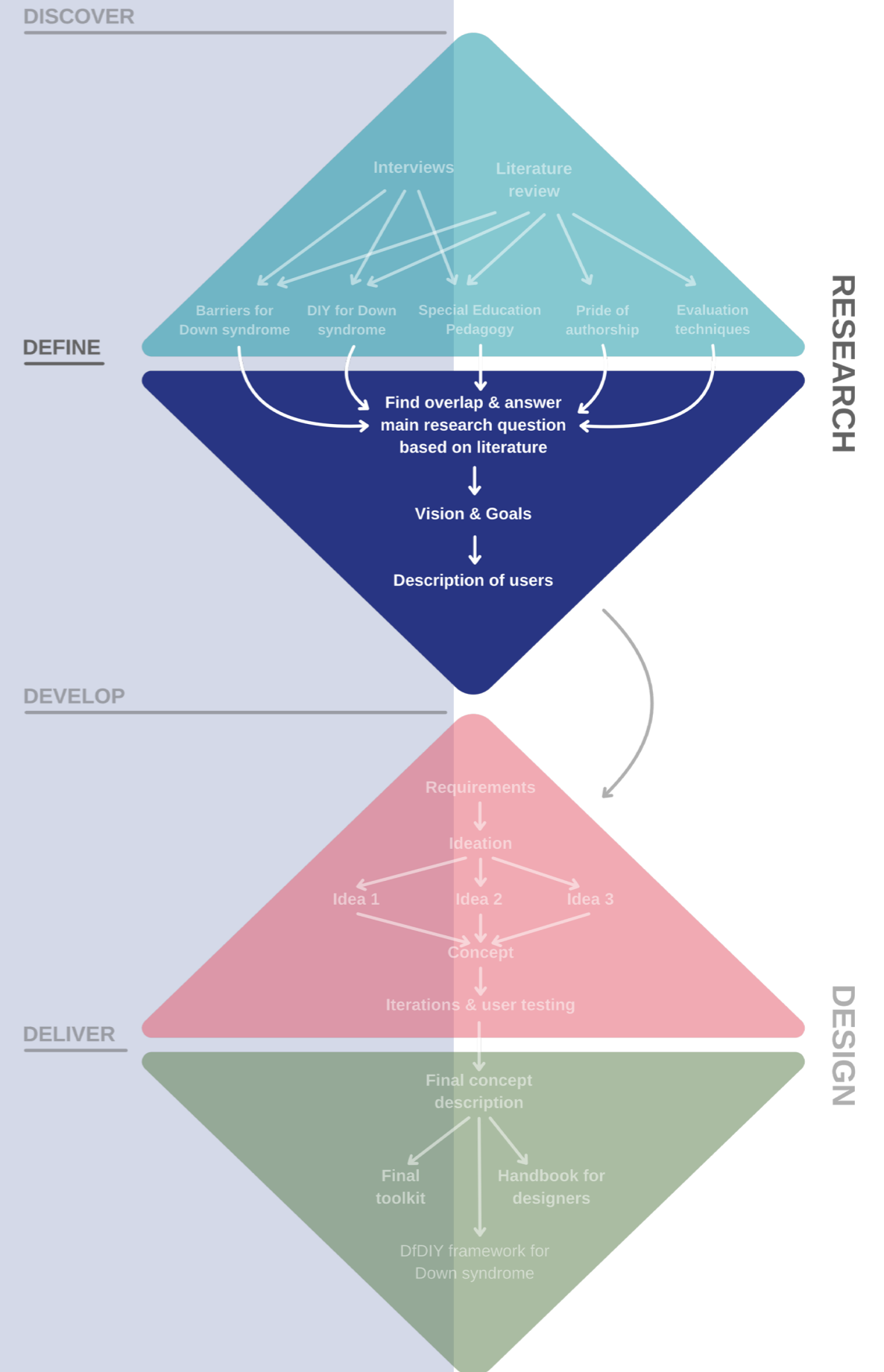
An answer to the main research question is given based on literature review, semi-structured interviews and all the findings from the sub-questions. The question is answered and guidelines for the design of a toolkit are given which will be used in the requirements section.

Vision and Goals

A vision, project focus and project goals are defined. These set the direction of the concept development.

Description of Users

Stakeholders, users and a description of the users is provided, along with their wishes and needs.



6. CONCLUSION

To help professional designers design for DIY, design guidelines were made based on the literature review. Conclusions from all previous research questions can be used to construct the design guidelines. These guidelines answer the main research question and lead to the design of a toolkit for people with Down syndrome, facilitating DIY design for individuals to engage with at home, while also being available for educators to implement in the classroom.

6.1. The guidelines for a Design for DIY toolkit for Down syndrome based on literature review

Toolkit creation

1. Use accessible components that remove the need for fine motor dexterity.
2. Use physical communication aids (like conversation cards) to ensure genuine creative input.
3. Replace text-heavy instructions with visual cues, like photographs and videos, and simpler language without becoming childlike or patronising.
4. Allow individuals sufficient time to process instructions and answer questions.
5. Externalise the planning process to reduce cognitive load by using AR instructions or by making instructions in a way that is directly applicable to a 3D environment
6. Create a safe environment that allows for independent exploration without constant caregiver supervision.
7. Make use of the scaffolding framework in combination with embedded instructions to reduce cognitive load and that empowers the user to become an active and independent contributor.
8. Make use of visual instructions or physical examples for the individual to follow.
9. Make use of the Universal Design for Learning (UDL) to provide the same information through visual, tactile and symbolic channels simultaneously to ensure effective

skill-building.

10. Implement 'errorless learning' to ensure independence and self-confidence.
11. Include elements of the Self-determination theory via co-creation, thus giving the user a say in the design of the product by giving them choices in what to create
12. Use the aesthetic scaffolding technique by using high-quality materials and finishing techniques that ensure the final product has a professional and polished look regardless of the user's fine motor precision.
13. Avoid the "medical look" by using modern colours and sleek textures for components, ensuring they look sophisticated.

Evaluation

14. Use Visual Analogue Scales (VAS) in combination with agency of display and time-on task to properly evaluate if the product creates a sense of pride of authorship.
15. Use Goal Attainment Scaling (GAS). Set individualised 5-point scales (from -2 to +2) to track progress. This ensures that even small improvements in independence or technical skill are documented.
16. Use process-oriented observation to record the making process to identify "bottleneck moments." Focus on where the user pauses or makes errors to determine if the toolkit design needs adjusting.
17. Use social validity assessments to survey both the users and their caregivers to determine if the skills learned are perceived as useful.
18. Assess preference by observing if the participant voluntarily chooses to use the toolkit over other activities, serving as a direct indicator of engagement and intrinsic motivation.

"How can the 'Design for DIY framework' be adapted to develop a toolkit that facilitates independence, skill acquisition and fosters a sense of pride for people with cognitive disabilities, focusing on (young) adults with Down syndrome, to advance the democratisation of design?"

6.2. Answer to the main research question based on literature review

The Design for Do-It-Yourself framework can be applied by shifting the designer's role into a facilitator of a toolkit that develops cognitive and physical skills by using communication cards, embedded and visual instructions, and pedagogical scaffolding. By ensuring the creation of high-quality, professionally finished artefacts, this approach fosters a genuine pride of authorship that mediates societal perception and extends the democracy of design to individuals with Down syndrome.

7. VISION AND GOALS

Next to the research section, the graduation project will consist of a practical section in which a toolkit design will be made. In the beginning of the literature research, a future goal and main research question were formulated. Now the research has been done, the graduation project goal can be further specified.

7.1. Vision

The future vision that forms the inspiration for this graduation project is:

“A future where the concept of ‘design democracy’ is extended to everyone, where designers empower both neurotypical and neurodiverse individuals to move from passive consumers to active makers, fostering independence through skill acquisition and a profound sense of pride of authorship.”

The research section has addressed the critical barriers, both physical and cognitive, that currently marginalise individuals with Down syndrome within the maker movement. To specify how designers can dismantle these barriers and contribute to a more inclusive future, the following sections detail the development of a DfDIY toolkit as a tangible application of these findings.

7.2. Project Focus

The focus of this project is the practical application of the Design for DIY (DfDIY) framework to create an inclusive making experience specifically for individuals with Down syndrome. By moving from theoretical research to tangible design, the project concentrates on the intersection of inclusive design, special education pedagogy techniques, participatory design and the field of DIY. A core focus is the mitigation of the ergonomic and cognitive pressures identified as key constraints during the research stage.

This involves the development of a physical product, a buildkit, that prioritises scaffolded independence. The design focus is not only on the final object created, but on the process of creation itself, ensuring that the tools, instructions, and materials are adapted to the unique motor and cognitive

profiles of the users. By focusing on aesthetic scaffolding, the project also aims to ensure that the resulting artefacts possess a professional quality, shifting the narrative from “therapeutic craft” to “competent authorship.”

7.3. Project Goals

The primary goal of this graduation project is to design a versatile DfDIY toolkit that facilitates the acquisition of both cognitive and physical skills through the act of making whilst also creating a sense of pride of authorship. This toolkit aims to empower individuals with Down syndrome to transition from passive consumers to active, independent makers, thereby extending the democracy of design to a demographic frequently excluded from the maker movement.

To ensure a broad impact and accessibility, the toolkit should be designed for multiple entry points:

- » **Individual use:** Empowering (young) adults with Down syndrome to order the toolkit for themselves when they have an intrinsic motivation for making and design. They should be able to engage with projects independently at home and ask for help when needed.
- » **Special education:** Providing a structured resource for teachers to implement within the classroom to support cognitive and physical skill acquisition and creative skill-building.
- » **Development of the users skills at home:** Offering parents a meaningful way to support their child's development through use of the toolkit.

The concept developed within this project serves as a representative example of the DfDIY framework's potential. While this specific iteration focuses on a particular set of skills and outputs, it is intended to demonstrate a scalable system/toolkit. The ultimate goal is to establish a toolkit design/methodology that could be applied to a wide variety of topics, ranging from electronics to furniture assembly, proving that the ‘maker world’ is accessible to everyone when the right support structures are in place.

8. DESCRIPTION OF USERS

8.1. Stakeholders

Designing a toolkit for this specific demographic requires a comprehensive understanding of the diverse stakeholder ecosystem. The following stakeholder map illustrates the interconnectedness of these actors, while the descriptions below detail the specific roles and interests each party holds in relation to the toolkit. The three primary stakeholders, the users, parents/guardians, and teachers, are explored in greater depth within the subsequent persona section.

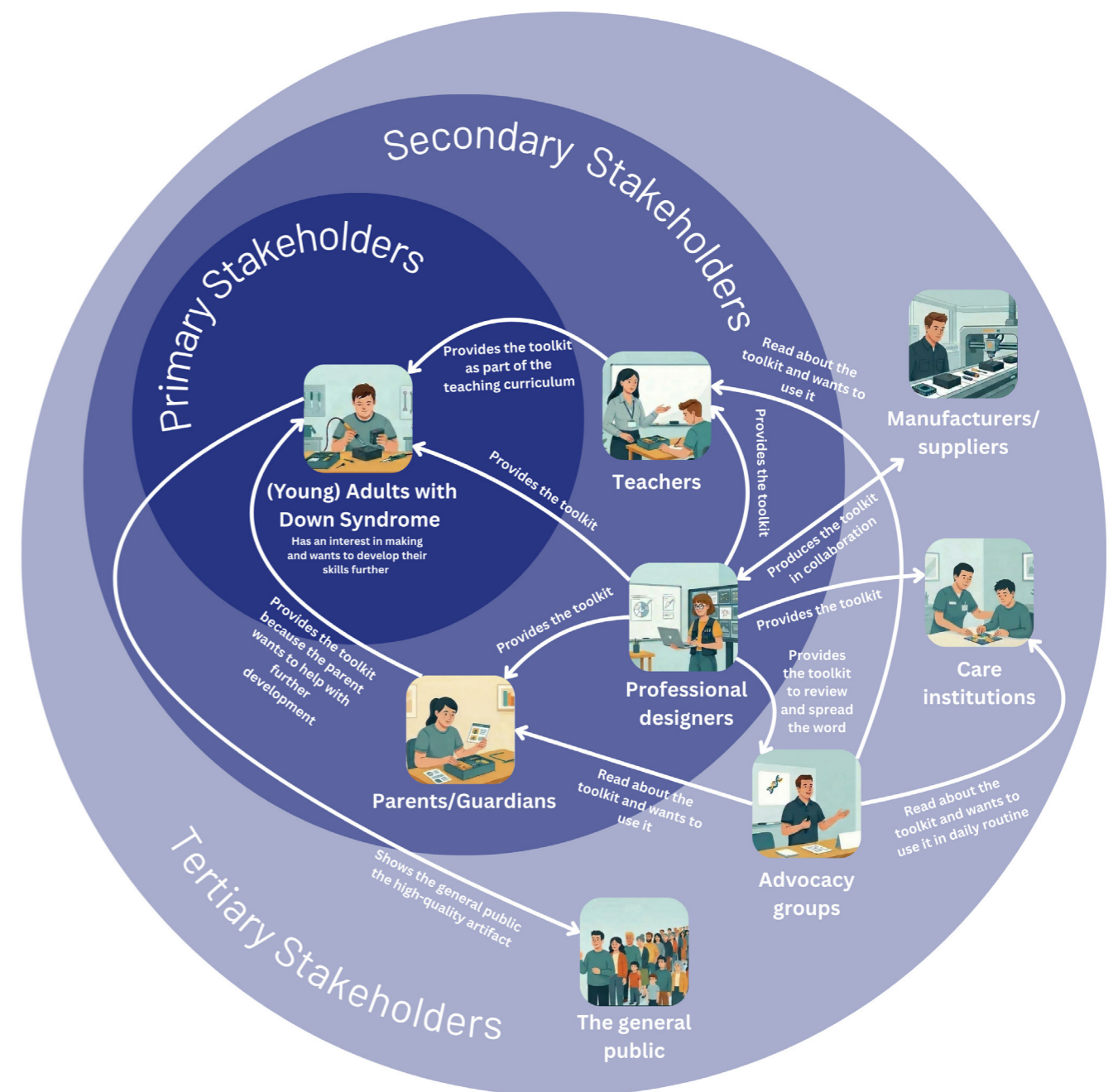


Figure 8: Stakeholder map showing the different stakeholders that play a role in the toolkit and the interaction they have with each other. (Image source: Google Gemini Nano Banana).

There are 8 stakeholders that need to be considered when developing this toolkit.

- » **The maker/user:** (Young) adults with Down syndrome who have just completed the Secondary Special Needs Education (VSO (Voortgezet Speciaal Onderwijs) or ZML (Zeer Moeilijk Lerenden Onderwijs) in Dutch).
 - Role: Active maker.
 - Interest/goal: Interest in making/design, skill acquisition, pride of authorship, increased autonomy.
- » **Parents/Guardians:**
 - Role: Home facilitator, purchaser.
 - Interest/goal: The development of their child's cognitive and physical skills; fostering social inclusion; moving away from repetitive tasks toward challenging, meaningful engagement.
- » **Teacher/Educator:**
 - Role: Classroom facilitator, purchaser.
 - Interest/goal: Student independence; structured cognitive and physical skill acquisition; reducing the 'paternalistic' supervision load.
- » **(Professional) Designer:**
 - Role: Shifting from 'creator of goods' to 'facilitator of design'.
 - Interest/goal: To validate the toolkit created based on the DfDIY framework; further the democratisation of design; facilitate the benefits and joy of making/designing.
- » **Manufacturers/suppliers:**
 - Role: Supply materials so the designer can create the toolkit.
 - Interest/goal: Collaborative production of the toolkit with the designer.
- » **Advocacy groups (like Stichting Downsyndroom):**
 - Role: Knowledge base and act as a bridge for distribution.
 - Interest/goal: Dismantling societal marginalisation and providing evidence-based resources for the community.
- » **Care institutions:**
 - Role: Institutional facilitators.
 - Interest/goal: Independence for the demographic; cognitive and physical skill acquisition; shift from "occupational" activities to meaningful skill-building.

- » **The general public:**
 - Role: The 'Audience' and social perceivers.
 - Interest/goal: Shifting from a perspective of pity to one of genuine respect; recognising user competence through the presence of high-quality artifacts.

8.2. Who is the toolkit for?

The toolkit is primarily designed for individuals with Down syndrome who possess an intrinsic interest and motivation in making and design. It serves those seeking a creative outlet while pursuing continuous cognitive and physical development, skill acquisition, and greater personal independence.

Furthermore, the toolkit is a resource for educators looking to integrate these developmental elements into their school curriculum. It provides a structured means to teach independence and scaffold the learning of new vocational and cognitive skills in a classroom setting.

Finally, the toolkit supports parents who wish to provide home-based enrichment. It offers a way to challenge their child, foster creative expression, and support a lifelong learning mindset beyond the traditional classroom environment.

8.3. Personas

The following personas serve as archetypal representations of the primary users and stakeholders within this project. The personas are based on the literature research and the interviews conducted with experts. Using the persona method as described in the Delft Design Guide (Zijlstra, 2020), they act as a "reality check" for the design process. Instead of just looking at abstract data, Lars, Sanne, and Linda are used to make sure the toolkit actually solves real experienced problems, like tricky fine motor tasks or confusing instructions. By keeping their specific goals and frustrations in mind, their daily challenges can be turned into the technical requirements needed to build a toolkit that truly works for them. These requirements can be found in the following section.

Who is the toolkit for?

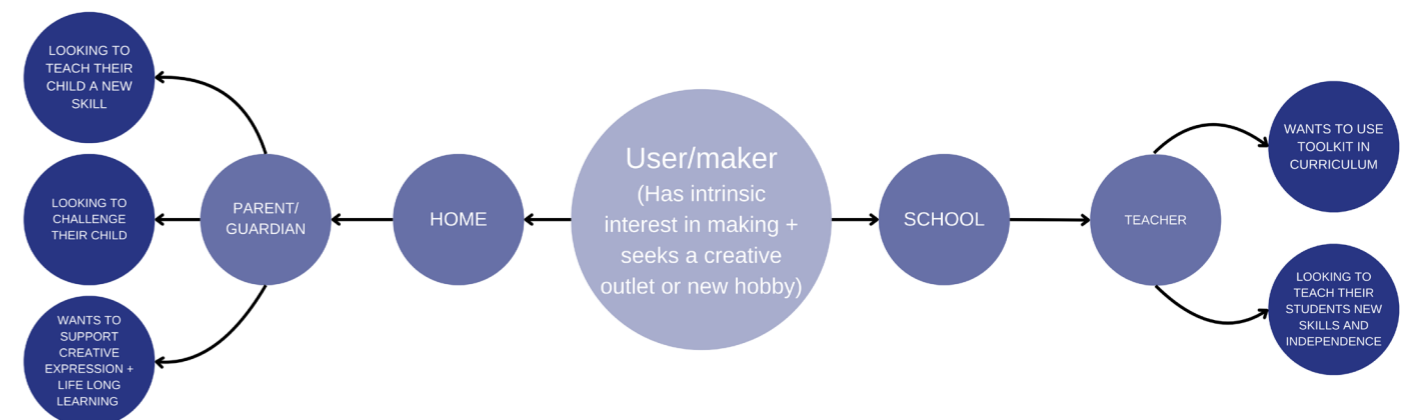


Figure 9: Map explaining who the toolkit is for, where it is used and what the stakeholders reasons are for buying the toolkit.

The Maker/User



Figure 10: Persona description of the maker/user. (Image source: Google Gemini Nano Banana).

The Parent/Guardian



Figure 12: Persona description of the parent/guardian. (Image source: Google Gemini Nano Banana).

The Teacher/Educator

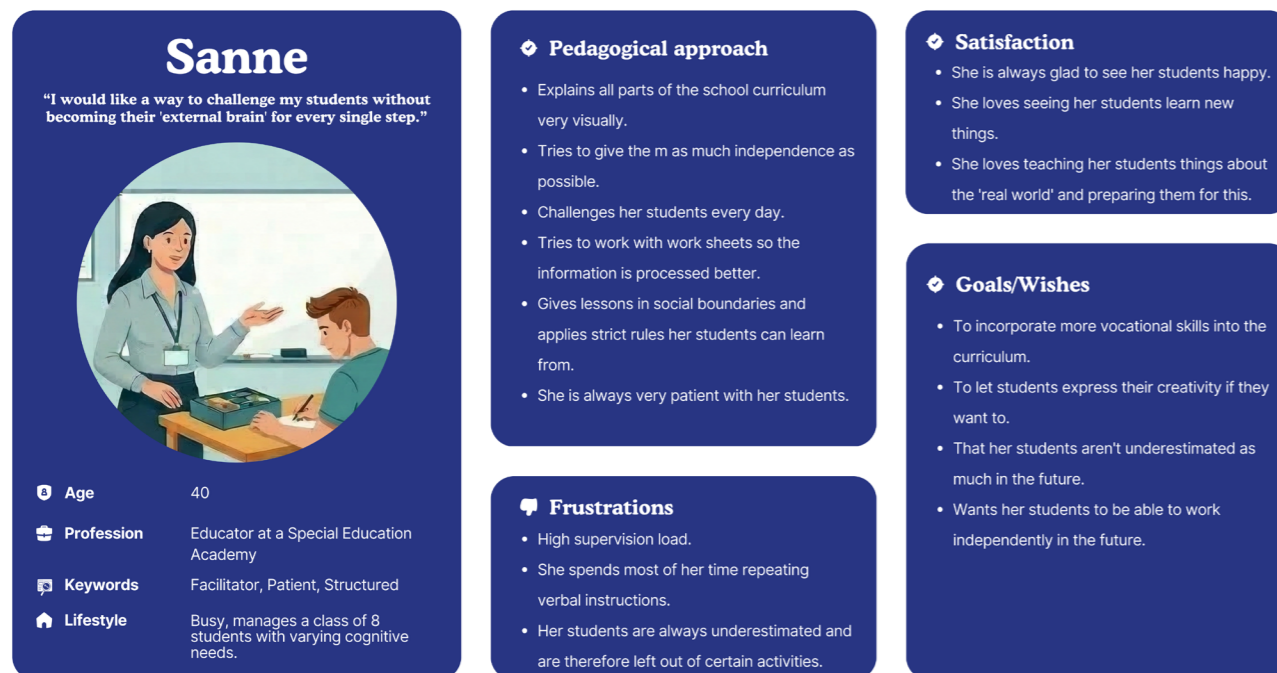


Figure 11: Persona description of the maker/user. (Image source: Google Gemini Nano Banana).

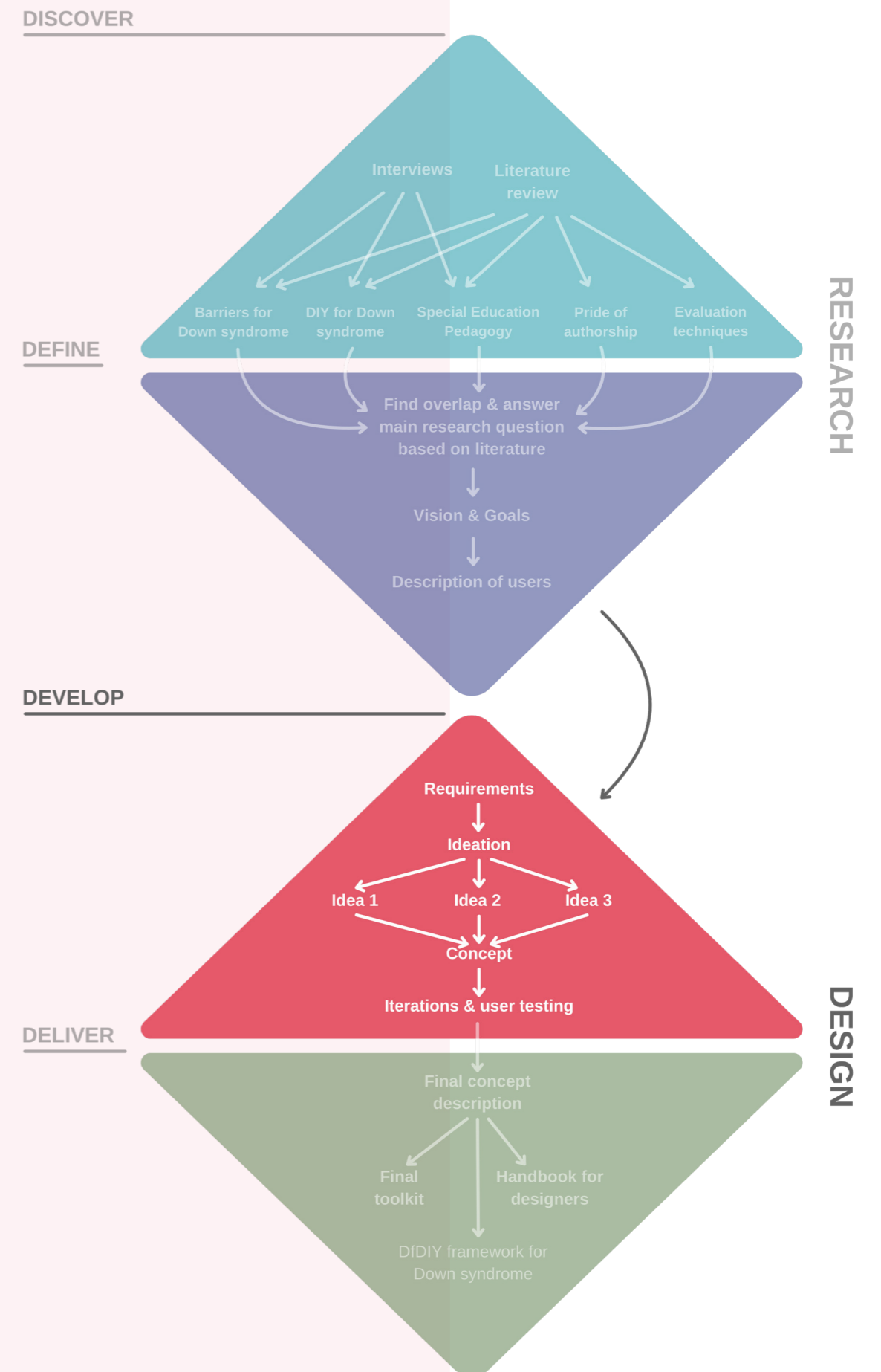
DEVELOP

Construction of Concept

Requirements are given and initial ideas and concepts are briefly discussed.

Iterations

Iterations and tests conducted are discussed. Findings and insights are discussed and applied and tested in the next iteration.



9. CONSTRUCTION OF THE CONCEPT

9.1. Requirements

The following Program of Requirements and Wishes (PoR&W) has been created according to core research insights from literature review, semi-structured interview insights, stakeholder mapping and personas. It also integrates the diverse needs and wishes of identified stakeholders, including users, educators, and parents.

To distinguish between the types of objectives:

- » Hard requirements are presented in standard text.
- » Wishes (soft requirements) are italicised.

While these wishes are more qualitative and harder to measure, they remain critical for the development and long-term success of the concept. For full traceability, the origin of each requirement is indicated by a colour-coded system.

- Project decisions (see chapter 7)
- Need (see chapters 5 and 8)
- Wish (see chapter 8)
- Guidelines for DFDIY toolkit (see chapter 6)
- Semi-structured Interview findings (see chapters 5 and 6)

9.1.1. Functional & Instructional requirements

- 100% of the assembly instructions must be delivered through high-quality visual cues (photographs, videos, or animations) to eliminate reliance on text.
- All written or verbal feedback within the system must use simplified Dutch/English that is age-appropriate for adults, avoiding any patronising or “child-like” terminology.
- The toolkit must utilize direct visual mapping to provide a 1:1 spatial guide, reducing the executive function load required for sequencing.
- Instructions must be physically “embedded” into the hardware using colour-coding or keyed geometries (e.g., shapes that only fit one way) to prevent incorrect assembly (use cues).
- Break complex fabrication tasks into single, immediate prompts or “missions” to bridge the gap between instruction and action.
- The toolkit must include a physical card-based

system (conversation cards) that facilitates at least three specific choice-points per project for user-driven co-creation.

- The toolkit should offer a variety of “missions” that avoid repetitive loops, specifically challenging the user to avoid boredom.
- The toolkit should teach physical and cognitive skills to the user.
- The toolkit should be fun and educational for the user.

9.1.2. Ergonomic & Physical requirements

- No component or step shall require “precision grips” (pinching) or handling objects smaller than 2cm; all connections must be manageable within the target’s group range of motor dexterity.
- All interactive elements must be placed within a horizontal reach zone of 30-50cm and a vertical height adjustable for shorter statures.
- The toolkit and/or designer must provide a minimum 20-second ‘processing window’ before repeating a prompt, ensuring the user is not pressured to respond immediately.
- The user of the toolkit should be able to work on the toolkit independently without needing a lot of guidance.
- The toolkit should teach cognitive skills, like independence.

9.1.3. Pedagogical & Cognitive requirements

- Every instruction must be presented through three simultaneous channels: Visual (screen/image), Tactile (physical cue), and Symbolic (icon).
- The system must implement ‘errorless learning’ by physically blocking incorrect actions before they occur, maintaining 100% initial success rates to build self-efficacy.
- Each project must transition from a “compliance phase” (fixed steps) to a “volition phase” where the user chooses between at least three different functional, aesthetic or design choices.
- The toolkit must include three levels of guidance

(High, Medium, Low) that are systematically reduced as the user demonstrates competence in specific skills.

- The toolkit should teach vocational skills that are directly transferable to professional environments, such as a restaurant or workshop setting.
- The toolkit should provide the users with the opportunity to express their creativity.

9.1.4. Aesthetic & Social requirements

- The final artifact produced by the toolkit must use high-quality materials (e.g., polished wood, metal, or sleek textiles) that mask inaccuracies.
- Component aesthetics must align with modern trends (sleek textures, contemporary colour palettes) and explicitly avoid a “medical” or “assistive” look.
- The toolkit must leverage the quality of the final artifact to trigger an ‘Affirmation Model’ in observers, shifting perception from pity to respect. The general society’s perception must shift away from underestimation of the target group.
- The toolkit should allow for a “Do-It-Together” (DIT) experience where the user and their parent or peer can collaborate if this is wished.
- The toolkit should contribute to the target group being underestimated less in the future by society.

9.1.5. Safety & Environmental requirements

- The toolkit must create a ‘fail-safe’ environment that allows for independent work without constant caregiver supervision.

9.1.6. Business, System & Stakeholder requirements

- The toolkit’s infrastructure must be functional in three distinct contexts: home (solitary), classroom (group), and home-guided (collaborative).
- The design of the toolkit must reduce caregiver ‘interventions per hour’ by at least 50% compared to traditional DIY methods by empowering independent action.

- The toolkit methodology should be applicable to diverse topics, from electronics to furniture assembly to textile design and more.
- The design of the toolkit must foster sustainability by creating ‘product attachment’, aiming to bridge the gap between production and consumption and counter the culture of passive consumerism.
- The design of the toolkit must include a business model and market size analysis.

9.1.7. Evaluation & Verification metrics

- Technical progress must be validated using Goal Attainment Scaling on a scale from -2 to +2 for every user test session.
- Use Visual Analogue Scales (VAS) with illustrative faces to quantify “pride” levels post-creation.
- Intrinsic motivation must be verified through preference assessments where the user voluntarily selects the toolkit over a passive leisure activity at least 70% of the time.
- Measure ‘focus duration’ and record 100% of “bottleneck moments” via observation to iteratively refine the design of the toolkit.

9.2. Initial Ideas and Concepts

Initial thoughts

Insights gathered during the literature review, the semi-structured interviews, the personas, and the stakeholder analysis collectively shaped the idea of developing a build kit. A recurring theme across all sources was the importance of tangible communication for people with Down syndrome. Traditional verbal or abstract questioning often creates barriers, whereas communication cards, as used by Stichting Downsyndroom, proved to be an effective way to support expression, decision-making, and autonomy. As the organisation explains, “These cards can help them articulate their thoughts... the young adults gain more insight into what they find important, what they are good at, and what they find difficult.” This made it immediately clear that any toolkit designed would need to embed a visual, card-based choice system as a core interaction method rather than an add-on.

At the same time, the theoretical foundation of the project, particularly Hoftijzer’s Design for DIY framework, pushed the concept beyond communication. Hoftijzer argues that the designer must shift from being a creator of finished products to a facilitator who enables others to build, modify, and take ownership of what they make. This emphasis on pride of authorship, agency, and democratising design aligned strongly with what the interviews revealed: young adults with Down syndrome are often underestimated, yet they express a strong desire to be creative, productive, and taken seriously. A build kit therefore became a natural vehicle for enabling them to construct something real, something they could point to and say, “I made this.”

The final spark came from analysing existing STEM build kits, particularly those from CrunchLabs and similar brands. These kits demonstrate how complex concepts can be broken down into accessible, engaging steps without losing the excitement of making. However, none of these kits are designed with cognitive accessibility, motor limitations, or co-creation in mind. This gap highlighted an opportunity: not only to design a build kit tailored to people with Down syndrome, but also to create a guideline for designers on how to develop inclusive DfDIY kits more broadly. The toolkit would therefore serve two audiences simultaneously: the makers themselves, and the designers who want to empower them.

With these foundations in place, communication cards for accessibility, Hoftijzer’s facilitator mindset, and STEM build-kits as structural inspiration, the next step was to brainstorm what the build kit should actually enable users to create. This ideation phase led to the three concepts described in the next section of the report and the choice of the final concept.

Ideation

Following the initial research phase, a broad range of ideas for potential build-kit projects was generated during brainstorm sessions. The brainstorm sessions were conducted individually and with a group of students from the Industrial Design Engineering faculty at the Technical University Delft. These ideas were then placed in a c-box (see figure 13) ranked on ‘ease of use’ and ‘degree of input’ and compared against the full list of requirements for the build kit. On top of that, ideas that emerged in the top right quadrant of the c-box were seen as most promising and discussed with special education teachers to hear their thoughts. Through this filtering process, three concepts emerged as the most promising and feasible directions to explore further: screen printing, a combined analogue-digital clock with a personal planning system, and boundary circles for social boundaries. The next step was to determine which concept should be developed further.

C-box idea comparison

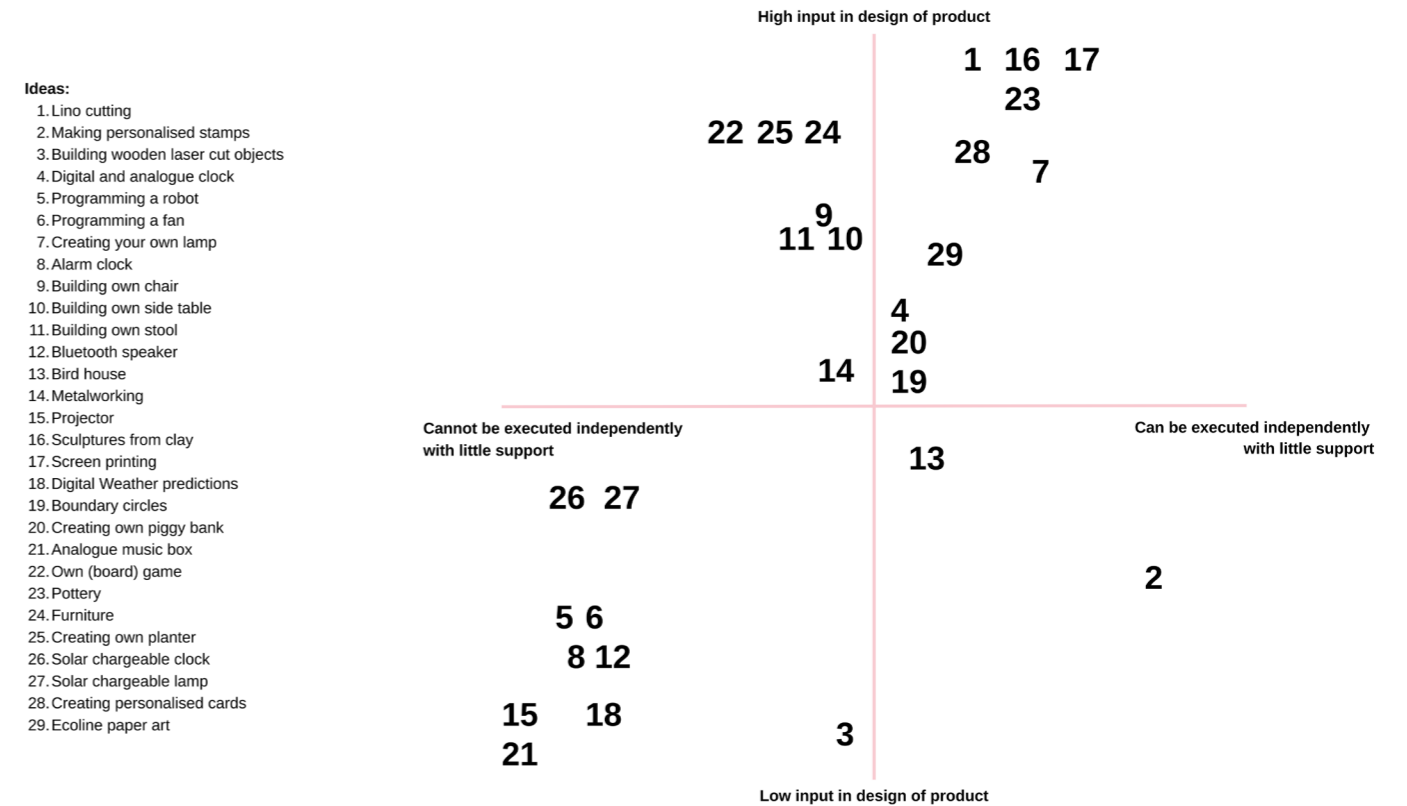


Figure 13: C-box comparing different ideas based on ‘ease of use’ and ‘degree of input’.

Three possible concepts for the case study

Each one of the three ideas aligned with the overarching goal of enabling people with Down syndrome to build something meaningful, learn new skills, and experience pride of authorship. However, they differed in complexity, accessibility, and pedagogical value.

To make this decision systematically, a Harris profile was used, evaluating each concept against the six most important requirements derived from the broader requirement list for the build kit. These six were selected because they most directly support the aims of DfDIY, the needs of the target group, and the pedagogical insights from the literature review and interviews.

Screen printing

A creative build kit in which users learn how stencils work, how negative space creates prints, and how to assemble and use a simple screen-printing setup. They choose what to print, which colours to use, and whether to design their own stencil or select a pre-made one.

Analogue-digital clock with planning system

A functional build kit combining basic electronics with time-management skills. Users assemble a clock, choose colours and icons for their daily planning, and learn to read time through a personalised, meaningful object.

Boundary circles

A social-skills-oriented build kit in which users design and assemble a set of personalised “boundary circles” to help them understand social distance, consent, and who belongs in which circle. They choose the visuals, layout, and the people represented.

Requirements Used in the Harris Profile

To select the concept with the strongest potential, a Harris profile was used. From the full requirement list, six requirements were selected that were most essential for evaluating the concepts. These were chosen because they directly support the goals of DfDIY, the needs of the target group, and the pedagogical insights from the literature review and interviews.

Below, each chosen requirement is paired with the

corresponding requirement category from the full list:

- » Co-creation: Requirement 6
- » Fine motor skills are minimised: Requirement 10
- » Learning new physical skills: Requirements 8 and 19
- » Learning new cognitive skills: Requirements 8 and 11
- » Scalable support: Requirement 18
- » Possibility of perception shift: Requirements 22 and 23

These six requirements formed the evaluation criteria in the Harris profile.

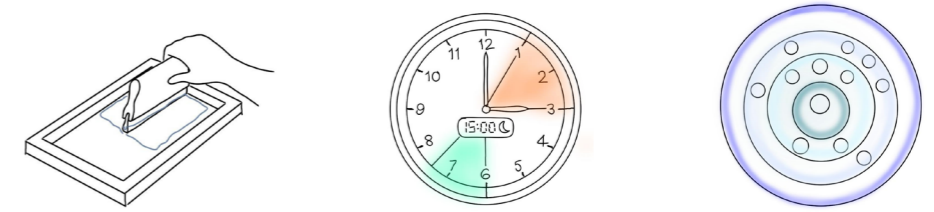
Outcome of the Harris Profile

When each concept was evaluated against these six requirements, screen printing emerged as the strongest option. It scored consistently high on co-creation, pride of authorship, and the ability to scaffold support. It also offered a balance between learning new physical skills (using tools, understanding stencils) and cognitive skills (sequencing steps, understanding negative space, independence), while keeping fine-motor demands manageable through pre-cut options.

Importantly, when presented with the options, teachers from special education stated screen printing as the most promising idea. They emphasised that it was probably the concept all students would enjoy most, that it offered a clear sense of accomplishment, and that it aligned well with the creative interests they observe daily in their classrooms. Furthermore, they expressed that wearing a personalised t-shirt, for example, could act as an ice-breaker, encouraging students to engage with others and thereby indirectly improving their social skills.

The convergence of the Harris profile results and the teachers’ judgement made the decision clear: screen printing was the concept with the strongest potential to support democracy in design, autonomy, creativity, skill acquisition and pride of authorship for people with Down syndrome. For these reasons, it was selected as the case study to be developed further in the next phase of the project (see figure 14 for the Harris profile evaluation).

Harris Profile comparison



	Screen printing				Analog-digital clock				Boundary rings			
	--	-	+	++	--	-	+	++	--	-	+	++
1. Co-Creation												
2. Fine motor skills are minimised												
3. Learning new physical skills												
4. Learning new cognitive skills												
5. Scalable support												
6. Possibility of perception shift												

Figure 14: Harris Profile comparing 3 fruitful options for the casestudy.

10. DESCRIPTION OF THE CONCEPT

10.1. Iterations

The development of the screen-printing toolkit followed an iterative design approach, consisting of one preliminary expert review and two user-tested iterations, followed by a final, untested iteration that consolidates lessons learned for future work. Each cycle was framed by the requirements set out in Chapter 9.1 and evaluated using the methods derived from sub-research question 5: Goal Attainment Scaling (GAS), Visual Analogue Scales (VAS), process-oriented observation of bottleneck moments, agency of display, and informal preference indicators. Together, these iterations bridge the gap between the theoretical guidelines for inclusive DfDIY (Chapter 6) and the final toolkit concept described in Chapter 10.

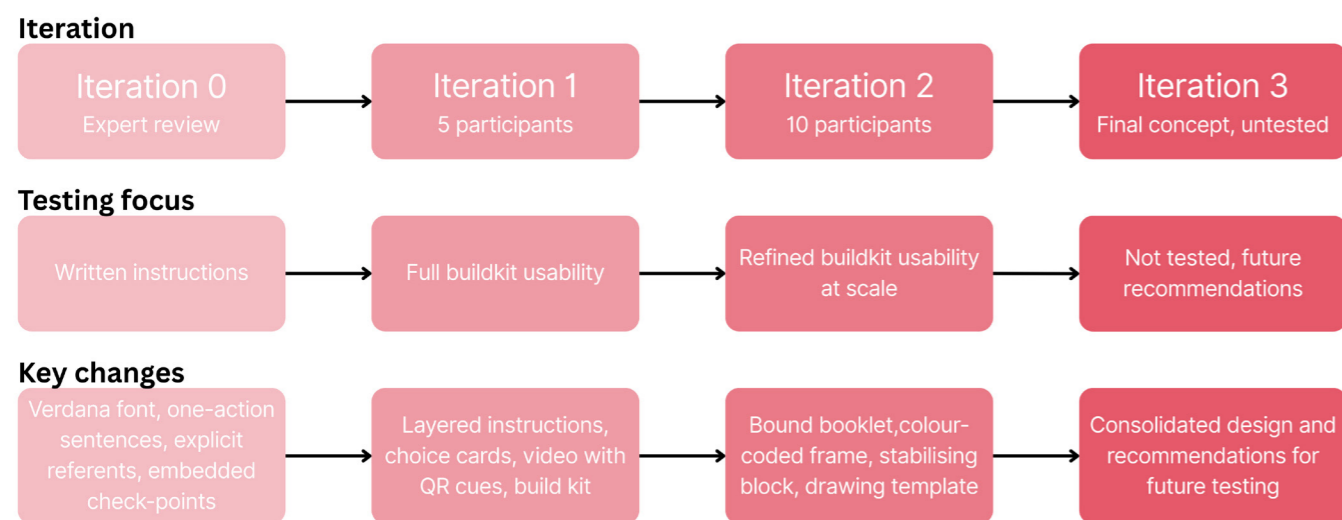


Figure 15: Overview of iteration cycles.

From Concept to Prototype: Technique and Material Selection

With screen printing selected as the case study, the next step was to determine which technique and materials would best suit the target group and the DIY kit format.

Whilst other screen printing techniques exist, such as photographic emulsion and thermal film methods, these require specialist equipment, chemical processing, and significant preparation time, making them unsuitable for a home or classroom DIY context. Stencil-based screen printing was therefore selected. It allows users to create their own design by drawing and cutting a shape, keeping the process tangible and personally meaningful from the first step. The technique is fast, requires minimal equipment, and keeps the focus on creative input rather than technical complexity.

Three stencil materials were tested: standard A4 paper, thicker cartridge paper (150 grams), and a plastic sheet. Standard A4 paper was rejected because it became saturated by the textile paint too quickly, and the plastic sheet made it difficult to see

the drawn design clearly during cutting. Thicker cartridge paper proved most suitable, holding its shape during printing whilst remaining easy to draw and cut. For the pre-made stencil options, a laser cutter was used to ensure clean, precise edges, a production step that could be incorporated into a final commercial version of the toolkit (see figure 16). During the user tests this was not possible for participants' own designs, as each school was only visited once, leaving no opportunity to process their drawings in advance.

Four fabric types were tested for the screen: hessian mesh, standard mesh, cheesecloth, and silk chiffon. The first three were rejected due to their open weave, which caused paint to bleed unevenly. Silk chiffon was selected for its fine, consistent pore size and ability to be pulled taut without distorting (see figure 17). In Iteration 1, a standard canvas stretcher frame was repurposed, however its raised edge created instability during use. For Iteration 2, frames were constructed from scratch using wooden battens, with dimensions built around an A4 size to keep the kit compact, portable, and easy for the target group to handle independently.

A shower squeegee was selected over alternatives such as a card or palette knife. A card was briefly tested but rejected as it offered no grip and required awkward wrist pressure. The shower squeegee's handle works best with the demographics low muscle tone grip and allows consistent pressure to be applied across the frame in a single stroke.



Figure 16: Lasercutting stencils for precision.

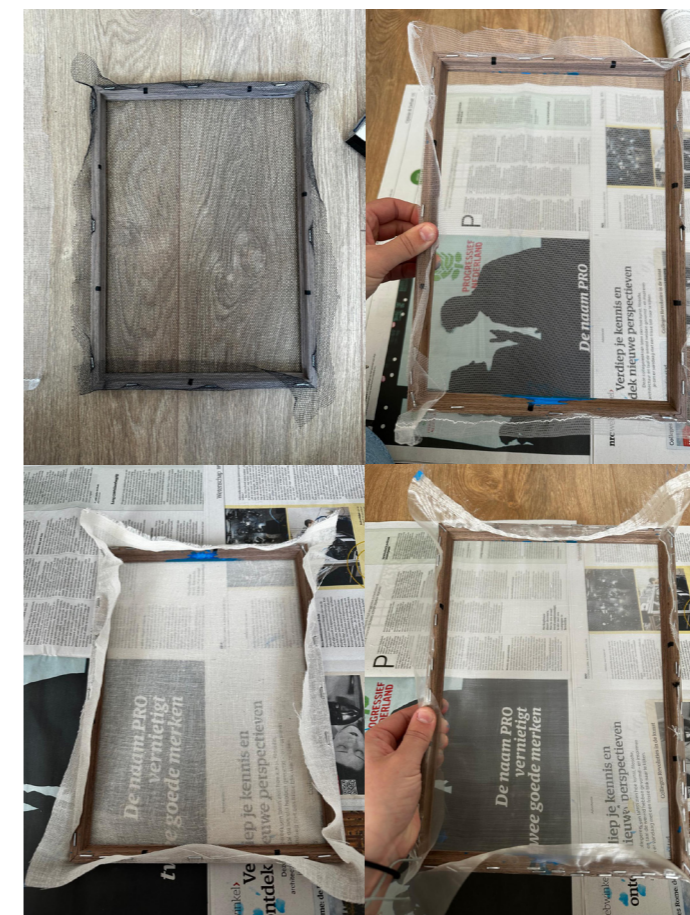


Figure 17: Four types of fabric tested. From top left to bottom right: hessian mesh, standard mesh, cheesecloth, silk chiffon.

10.2. Iteration 0

Preliminary expert review of the instructional language

Before producing any physical prototype, a short feedback session was held with a teacher from one of the partner education initiatives. The aim was not to test a working toolkit, but to validate the written form of the assembly instructions before investing in printed materials and supporting media. The teacher reviewed a draft set of written instructions and gave feedback on language, typography, and structure.

Five concrete recommendations emerged from this session, each of which directly informed Iteration 1:

- » The first concerned **typography**. The initial draft used a display font with decorative serifs. The teacher recommended replacing this with Verdana, a sans-serif typeface commonly used in materials for people with neurodiverse cognitive profiles, because of its open letterforms and consistent stroke weight (nkd, n.d.).
- » The second concerned **sentence structure**. The teacher emphasised that each instruction must contain only one action. Sentences combining multiple steps, for example, “fold the fabric over the frame and staple it down”, overload working memory and rely on a degree of forward-planning that is often absent in this group (“ze hebben geen vooruitdenkend vermogen”). This insight reinforces the Cognitive Load Theory findings from Chapter 5.3 and supports Requirement 5 (instructions broken into single, immediate prompts).
- » The third concerned **referential clarity**. Pronouns such as “it” or “this” should be replaced with the explicit name of the object being referenced. The reader cannot be expected to hold the antecedent in working memory across sentences.
- » The fourth concerned **check-points**. The teacher suggested embedding self-check moments in the instructions, allowing the user to confirm progress without needing facilitator approval. This connects directly to Requirement 16 (errorless learning) and Requirement 13 (independent work without heavy guidance).
- » The fifth concerned overall **visual tone**. The instructions should be visually calm, structured, and use large letters and images, but without becoming child-like in aesthetic.

All five recommendations were incorporated into the design of Iteration 1.

10.3. Iteration 1

First user-tested prototype

Aim

Iteration 1 was the first complete prototype of the screen-printing toolkit and aimed to test three things simultaneously: whether the layered instructional system (printed instructions, embedded photographs, QR-linked video, and verbal facilitator support) reduced reliance on caregivers (Requirements 3, 7, 13). Whether the card-based choice system genuinely supported volition and a sense of authorship (Requirements 6, 17, 20). Lastly, whether the physical components of the kit were accessible given the motor profile of the user group (Requirements 1, 10).

Description of the prototype

The prototype consisted of four integrated elements. The first was a printed instruction booklet, with one step per page, photographs of each action, simplified Dutch sentences, and a QR code on every step linking to the relevant timestamp of a single instructional video. The second was a full instructional video, showing the entire process from start to finish, intended to be watched in full before beginning the task. The third was a set of physical choice cards, organised into colour-coded categories (design, colour, object to print on) so that the

user could “build” their project decisions through tangible selection rather than verbal abstraction, a direct application of the tangible co-design findings in Chapter 5.1. The fourth was a physical build kit containing a wooden frame, synthetic mesh, a staple gun, textile paint, a squeegee, masking tape, a precision knife, and pre-cut stencil options for users who preferred not to design their own.

Iteration 1 was tested with five young adults with Down syndrome at one of the partner education initiatives. Each participant was asked to complete the full screen-printing process: choosing their design and material via the cards, constructing the screen-printing frame, preparing the stencil, and printing onto their chosen object. Three teachers were present across the sessions as observers.

Evaluation took place at two moments. Before the activity began, a short introductory written form was given to each participant to gauge their baseline expectations and familiarity with the activity, and to establish a reference point for later comparison. After the activity, a written evaluation form was completed, using illustrated face scales (Visual Analogue Scales), yes/no items, and a small number of open prompts to capture participants’ sense of pride, perceived independence, perceived difficulty, and willingness to repeat the activity. Throughout the session itself, process-oriented observation was used to record bottleneck moments and the frequency of facilitator intervention.

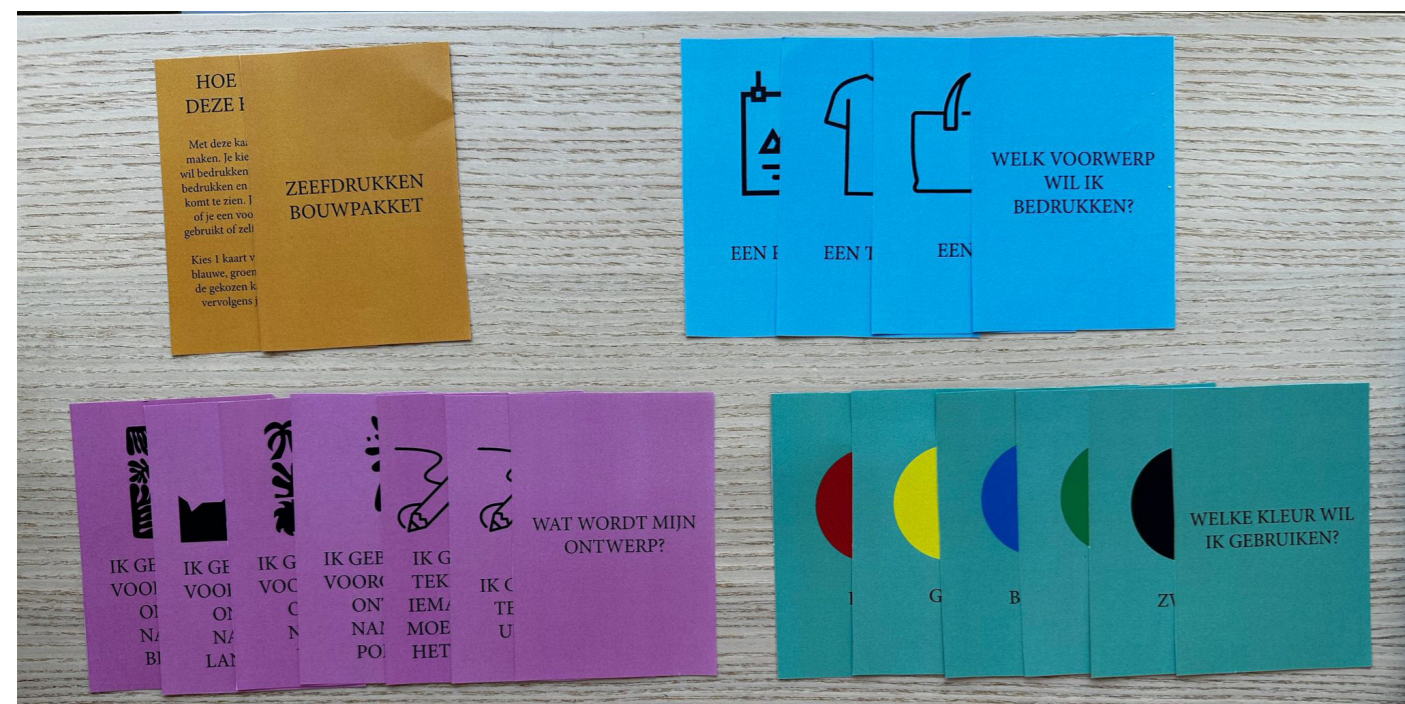


Figure 18: Overview of first iteration of choice cards.



Figure 19: Overview of some of the first iteration of choice cards design.

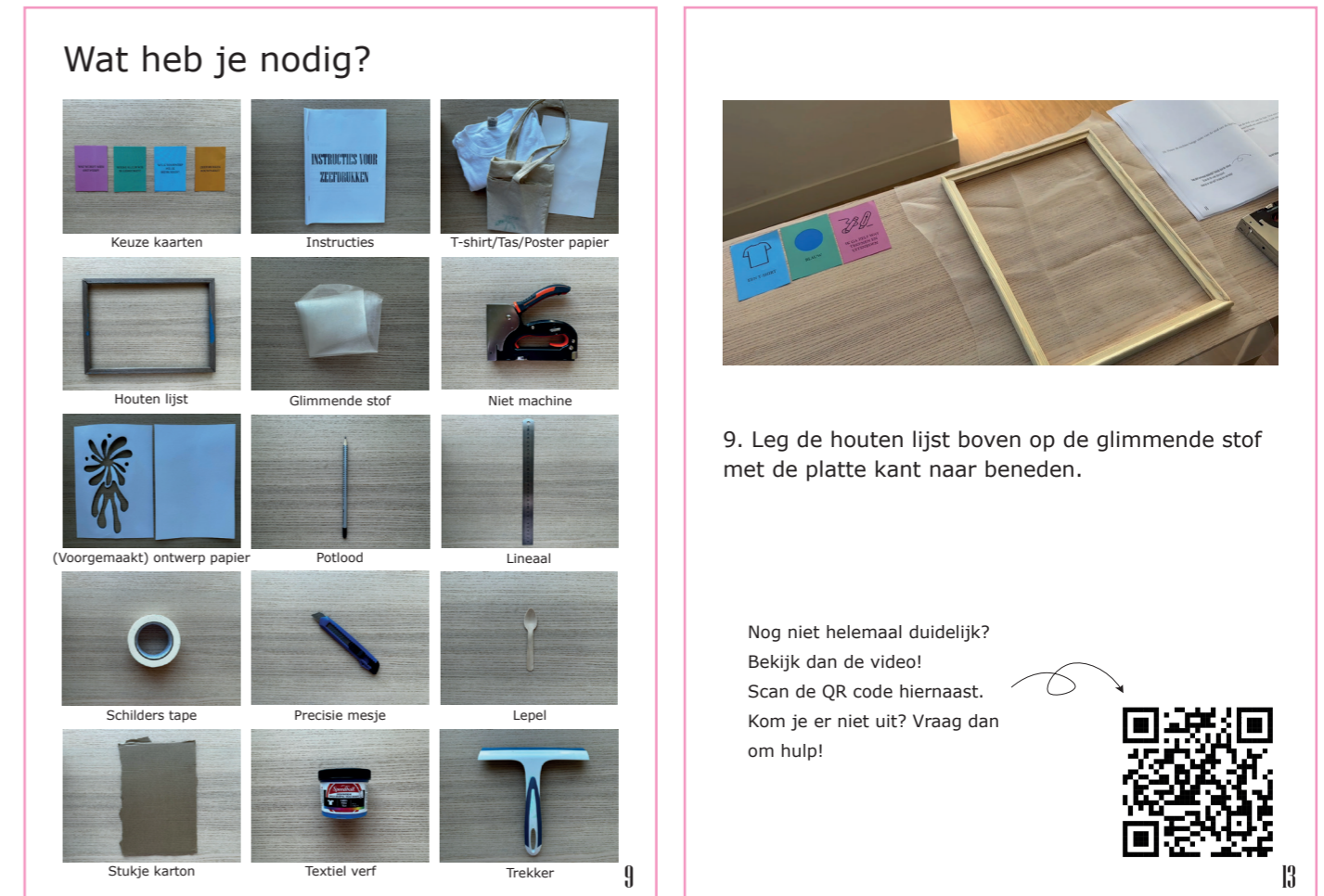


Figure 20: Two pages from the instruction booklet (“What do you need?” and a page from creating the screenprinting window).

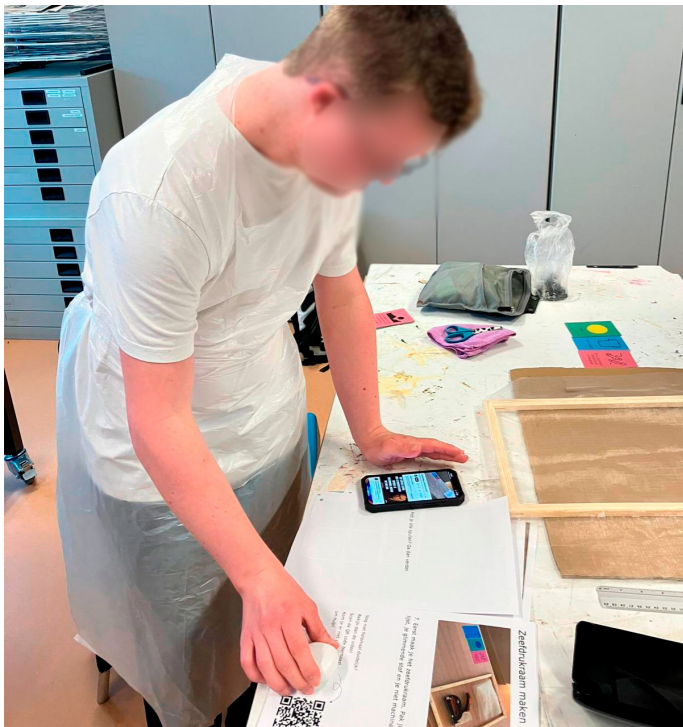


Figure 21: Image of a participant referencing the instruction video via QR code.

Test setup

Iteration 1 was tested with five young adults with Down syndrome at one of the partner education initiatives. Each participant was asked to complete the full screen-printing process: choosing their design and material via the cards, constructing the screen-printing frame, preparing the stencil, and printing onto their chosen object. Three teachers were present across the sessions as observers. The teachers were asked explicitly to not help the participants unless the participants themselves asked for help. This was crucial to test the independence during the making process of the participants.

Evaluation took place at two moments. Before the activity began, a short introductory written form was given to each participant to gauge their baseline expectations and familiarity with the activity, and to establish a reference point for later comparison. After the activity, a written evaluation form was completed, using illustrated face scales (Visual Analogue Scales), yes/no items, and a small number of open prompts to capture participants' sense of pride, perceived independence, perceived difficulty, and willingness to repeat the activity. Throughout the session itself, process-oriented observation was used to record bottleneck moments and the frequency of facilitator intervention.

Findings

The findings are reported in three layers: behavioural observation, participant self-report, and teacher feedback.



Figure 22: Image of a participant struggling to use the staple gun on their own.

Behavioural observations

All five participants engaged actively with the choice cards. The colour coding of the card categories allowed participants to grasp the selection logic immediately: one card from each colour. None of the five required a verbal explanation of the card system. The full-length video, watched before beginning, also functioned as expected, participants referred back to it through QR codes at moments of uncertainty rather than asking the facilitator (see figure 21). However, three recurring bottlenecks were observed. The stapling of the mesh was challenging for two participants, both because the staple gun required considerable downward force and because the thin wooden frame made the staple gun unstable, making the action feel risky/dangerous for the teachers and participants (see figure 22). The stencil-cutting step required facilitator help in all five cases, primarily because the precision knife demanded a level of fine motor control that exceeded what was reasonable to expect, and because participants did not anticipate that everything they cut away would become the printed shape (see figure 23). Frame orientation during stapling, which side faces up, where the staples should land, was also a point of confusion that the written and visual instructions did not fully resolve. A further unexpected observation concerned drawing behaviour. When designing their own stencil, several participants drew shapes within shapes and used the entire surface of the paper, not anticipating that only the cut-out areas would print and that an outer margin was required (see figure 24).

A practical issue with the instructional materials themselves also surfaced. The loose, unbound pages quickly became



Figure 23: Image of a participant struggling with how to hold the knife and how to cut.



Figure 24: Image of a participant drawing shapes within shapes and not realising that those inner shapes will not be printed in their t-shirt.

disordered on the work surface, and the thin paper proved difficult to handle.

Participant self-evaluation

All five participants indicated that they wanted to show their finished product to someone, a clear marker of agency of display and, by the definition adopted in Chapter 5.4, a behavioural proxy for pride of authorship. All five also selected the happiest face on the VAS when asked how they felt about screen-printing as an activity, and all five expressed a wish to do the activity again. Four of the five reported they had learned something new, all citing screen-printing itself, with one also citing design. While the fifth had prior experience with t-shirt making. Two participants indicated they could do the activity entirely independently, two indicated they could not do everything alone, and one gave a mixed response. The steps participants identified as requiring help mirrored the observed bottlenecks: cutting the design (all five participants) and stapling (two participants). Four of the five rated the instructions as easy to follow, one rated them as relatively easy. Three found the activity itself difficult, two did not. All five expressed appreciation for being given choices about what to make, what colour to use, and which design to print. Spontaneous remarks included “I like that it is super creative” and “I like that I was able to do it, I even had tears of joy.” (see figure 25).

Teacher feedback

The three teachers observing the sessions independently noted that the choice card system was the strongest element of the toolkit, both because it gave participants visible authorship over the outcome and because the colour-coded structure made the selection process self-evident. They estimated that participants required facilitator help fewer than five times on average across the full activity, an early indication that Requirement 28 (reducing caregiver interventions) is achievable. All three teachers commented that participants demonstrated more independence than they had expected, one participant reportedly told the teacher, “no, I don’t need any help, I can do it myself.” The pre-activity video was described as particularly valuable because it allowed participants to become familiar with what was expected of them by seeing the full process before beginning.

Insights

Iteration 1 confirmed the central pedagogical hypothesis of the toolkit: when the instructional system is layered (video, photographs, embedded QR cues, tangible choice cards)

and the user is given genuine volition over the outcome, participants engage with complex fabrication tasks and produce results they identify as their own. The strong consistency between observed agency of display, self-reported pride, and the wish to repeat the activity provides convergent evidence that the toolkit creates the conditions for pride of authorship described in Chapter 5.4.

However, three categories of friction emerged. The first is physical. Components designed around standard motor profiles (the staple gun, the precision knife) created bottlenecks. The second is structural. The instruction booklet’s format, loose pages, one step per page, placed an unintended cognitive demand on participants, who were unable to anticipate upcoming steps and lost track of order. The third is anticipatory. Participants reliably did not act on requirements that were not made explicit, including basic spatial requirements such as leaving a margin or not nesting shapes within shapes. This confirms a teacher’s earlier observation about the absence of forward-planning and supports a stricter application of errorless-learning principles in the next iteration. However, besides these bottlenecks, all participants managed to complete the tasks at hand and went home with their own designed T-shirt that they were very proud of (see figure 26). (For more images of the tests conducted, see Appendix).

Implications for Iteration 2

The following changes were carried forward into Iteration 2:

- » The instruction format was changed from a folder of loose pages to a bound booklet with multiple steps per page, drawing on the structural conventions of ‘Kijk ik kook’ (Weuts, n.d.), a cookbook designed for readers with Down syndrome. This addresses the page-handling problem and supports the user in seeing what is coming next. On top of that, some instructions were made more explicit so that the user does not have to fill in any missing gaps in the instructions themselves.
- » The choice cards were simplified. The four pre-made design options were consolidated onto a single card to make the available options clearer, and the typography was aligned with the booklet’s Verdana setting for visual consistency.
- » The wooden frame was modified to apply errorless learning to the stapling step. One side of the frame was coloured blue to indicate orientation, and small markings were added to show exactly where each staple should be

placed. This makes the correct action easier (Requirement 16).

- » A stabilising wooden block was added beneath the staple gun’s working area, so that participants could press down without the staple gun becoming unstable. This is a hardware adaptation in the spirit of the Bespoke DIY-AT

approach described in Chapter 5.2.

- » For the design step, a bordered drawing template was introduced, with a printed margin showing the maximum drawable area and small example shapes illustrating an appropriate level of complexity. This externalises a spatial requirement that participants did not infer independently.

Measure	Participants (of 5)	Notes
Pride of authorship (VAS)	5 out of 5	All participants selected the happiest face and reported being proud of what they made.
Willingness to repeat	5 out of 5	All participants indicated they would like to do the activity again.
Agency of display	5 out of 5	All wanted to show their finished product to someone, a behavioural proxy for pride.
Perceived difficulty	3 out of 5	Three found the activity difficult, two did not. Difficulty did not reduce enjoyment.
Instructions easy to follow	4 out of 5	Four rated the instructions as easy to follow, one as relatively easy to follow.
Perceived independence	2 / 5 full, 1 / 5 partial	Two indicated full independence, two indicated they could not do everything alone, one gave a mixed response.
New skills learned	4 out of 5	All four cited screen-printing, one also cited design. The fifth had prior experience.
Observed bottlenecks	—	Stencil cutting (5 / 5 needed help), stapling the mesh (2 / 5), frame orientation, and spatial design errors (margins, nested shapes).

Figure 25: Overview results from participant self-evaluation.



Figure 26: Overview of the final results from test 1 with iteration 1.

10.4. Iteration 2

Aim

Iteration 2 aimed to test whether the changes introduced in response to Iteration 1 successfully resolved the friction points identified in the previous round, whilst preserving the elements that participants and teachers had responded to most strongly. Specifically, this iteration tested whether the bound, multi-step booklet reduced page-handling problems and supported anticipation of upcoming steps (Requirements 3, 7). Whether the errorless-learning adaptations to the wooden frame and staple gun reduced bottleneck moments during frame construction (Requirements 10, 16). Whether the bordered drawing template prevented the spatial design errors observed in Iteration 1 (Requirements 4, 15). Lastly, whether the toolkit remained engaging and produced a comparable sense of pride of authorship in a larger participant group.

Description of the prototype

Iteration 2 retained the four-part structure of Iteration 1, instructional video, printed instructions, choice cards and physical build kit, but introduced five targeted modifications.

The instruction booklet was redesigned as a bound document with three steps per page, based on the layout of 'Kijk ik kook' (Weuts, n.d.), a cookbook designed for readers with Down syndrome. This format allows the user to see upcoming steps without losing their place, compensating for the absence of forward-planning behaviour observed in Iteration 1 (see figure 27 and appendix for the full instructions). On top of that, some instructions were made more explicit so that the user does not have to fill in any missing gaps themselves.

The choice cards were simplified. The four pre-made design options, previously distributed across separate cards, were made onto a single card showing all options together (see figure 28 and appendix for the full card set). The card typography was also harmonised with the booklet, using Verdana throughout for visual consistency.

The wooden frame was modified to embed instructional guidance directly on the frame. One side of the frame was painted blue to indicate orientation and small markings were added on the opposite side of the frame at each location where a staple should be placed (see figure 29). These cues apply errorless learning by making correct placement an easier action (Requirement 16).

The staple gun setup was stabilised through the addition of a wooden support block placed beneath the staple gun at the same height of the frame. This allows the user to apply downward force without the staple gun becoming unstable and dangerous (see figure 30). The modification follows the Bespoke DIY-AT approach described in Chapter 5.2: rather than replacing a standard tool, the workspace is adapted to make it accessible.

The drawing template was introduced for participants designing their own stencils. A border defined the maximum drawable area and a small set of example shapes illustrates an appropriate level of design complexity (see figure 31). This externalises spatial requirements that participants did not infer independently in Iteration 1.



Figure 27: A page from the instruction booklet showing the new instruction layout based on the cookbook 'Kijk ik Kook' (Weuts, n.d.).



Figure 28: New "what will I design?" choice cards with Verdana typeface.



Figure 30: Adapted staple gun to make stapling stabler and safer. (top: old configuration, bottom: new configuration).



Figure 29: New flat wooden frame design with embedded instructions (a blue side and staple markings).



Figure 31: Border as maximum drawing area when user wants to create own design.

Test setup

Iteration 2 was tested with ten young adults with Down syndrome, aged between 17 and 25, at one of the special education initiatives. As in Iteration 1, each participant was asked to complete the full screen-printing process: selecting their design, colour and material via the cards, constructing the screen-printing frame, preparing the stencil and printing onto their chosen object. Two teachers and the researcher were present as observers (see figure 32). As in Iteration 1, facilitators kept their hands behind their backs and only helped when a participant explicitly asked for it, ensuring that observed independence reflected genuine capability.

Evaluation took place at two moments. Before the activity began, a short verbal conversation was held with each participant to gauge baseline expectations and familiarity with screen-printing, providing a reference point against which post-activity responses could be compared. A verbal rather than written format was used this time to ensure sufficient time for the full making activity. After the activity, a written evaluation form was completed using illustrated face scales (Visual Analogue Scales), yes/no items and open prompts capturing pride, perceived independence, perceived difficulty and willingness to repeat. Throughout the session, process-oriented observation was used to record bottleneck moments, facilitator interventions and instances of agency of display.

Findings

The findings are reported in three layers: behavioural observation, participant self-report and teacher feedback.

Behavioural observations

All five modifications introduced in Iteration 1 functioned significantly better in this round. The bound booklet with multiple steps per page proved much easier to handle than the loose pages from Iteration 1. Participants closely followed the booklet and wanted to follow the steps exactly as written, which could suggest the format felt trustworthy and clear. Some participants moved through the instructions with ease whilst others found the amount of information occasionally overwhelming, indicating that a careful balance still needs to be found between providing enough guidance and not providing too much. The same observation applied to the instructional video: whilst all participants paid close attention at the start, some began to drift after a longer period, which is consistent with the shorter attention spans and reduced working memory capacity described in Chapter 5.3. QR codes

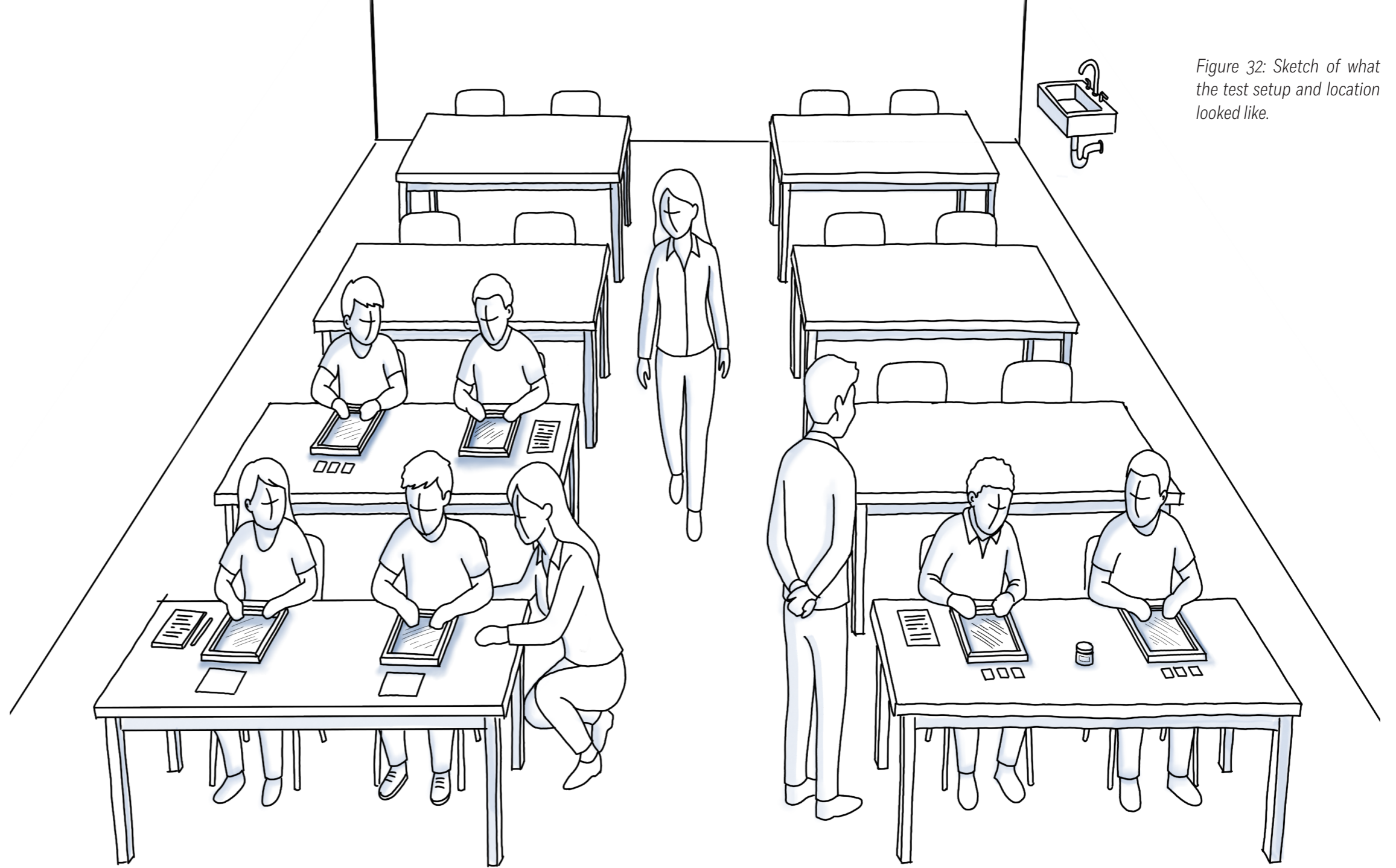


Figure 32: Sketch of what the test setup and location looked like.

were available for participants to refer back to specific steps but were rarely used, suggesting that the printed instructions were clear enough to follow without needing the video as a fallback, a clear improvement on Iteration 1.

The choice card system worked well across the group. Participants with a higher cognitive level made their selections independently whilst participants with a lower cognitive level were able to indicate their preferences when asked directly, pointing to their chosen card. However, some participants with a lower cognitive level occasionally picked more than one card per colour category, suggesting the one-card-per-colour rule was not yet fully self-evident. This led to a design decision described in the implications section below.

Frame construction remained the most challenging step but showed clear improvement. The first few staples caused

hesitation and uncertainty across almost all participants. However, after completing one or two staples together with a facilitator, participants quickly gained confidence and were able to continue independently. As one participant put it: “the first time is always hard but next time I can do it completely by myself.” The blue side indicating frame orientation and the staple placement markings on the opposite side were described by teachers as particularly effective, as they made it immediately clear to participants what went where. The wooden support block made the stapling action noticeably safer and more stable. On average, participants needed facilitator help only one to two times across the full activity, a significant reduction compared to Iteration 1. Participants with a lower cognitive level needed help slightly more often but still far less than expected.

A further observation concerned the paper choice cards.

Several participants found them difficult to pick up and handle, as the thin paper was floppy and hard to grip, a physical accessibility issue consistent with the motor profile described in Chapter 5.2.

Participant self-report

All ten participants selected the happiest face on the VAS when asked how they felt about screen-printing. All ten expressed pride in what they had made. When one participant unveiled their printed design, they exclaimed: "oh it actually worked! I am so proud!", a spontaneous and unambiguous example of agency of display and pride. Most participants said they could do the activity independently, identifying frame construction as the one step where they needed support, and some also mentioned stencil cutting. Eight of the ten said they would like to do it again. After completing their first object, several participants immediately wanted to print a second and many said they wanted to make a poster as a gift for someone. All ten found the activity straightforward, with frame construction being the only step they described as difficult or that they were hesitant about. Participants particularly valued being able to choose what to make, what colour to use and what design to print, this freedom of choice was cited by most as the favourite part of the experience. One participant completed the entire activity without asking for help at all, which came as a surprise to both the researcher and the teachers present (see figure 33).

Teacher feedback

Both teachers noted that the modifications introduced in Iteration 2 were a clear improvement. The adapted staple gun setup made the action easier, safer and more stable. The blue side indicating frame orientation and the staple placement markings on the opposite side were highlighted as particularly effective, as they gave participants immediate visual clarity without requiring verbal explanation. Teachers had expected participants to need significantly more help than they did. They observed that being involved in the design and choice process gave participants a strong sense of autonomy and motivation and that participants were noticeably more productive as a result. They noted that all participants found the activity very enjoyable and that several were able to work more independently than anticipated. Notably, some participants who finished early began helping their classmates, which teachers had not expected. The pre-made design options were described as especially useful for participants with a lower cognitive level and for those who preferred not to design their own stencil. Both teachers felt participants had learned new skills, particularly screen-printing itself and the understanding that cutting away a shape

is what creates the printed result. One point of improvement raised was that some words in the instructions were still too difficult, for example, the word "ontwerp", suggesting that the language needs one further round of simplification. Both teachers described the experience as highly valuable for the participants and noted that being included in the design and choice process made participants feel genuinely autonomous and motivated throughout the activity.

moment of guided practice before participants can proceed independently. See figures 34, 35, 36 and 37 for images of the second test and the final results.

Insights

Iteration 2 confirmed and strengthened the findings of Iteration 1. When the instructional system is layered, the physical components are adapted to the user's motor profile and the user is given genuine choice over the outcome, participants with Down syndrome engage independently with a complex fabrication task and produce results they identify as their own. The reduction in facilitator interventions from an average of fewer than five in Iteration 1 to one to two in Iteration 2 provides concrete evidence that the toolkit is moving in the right direction with respect to Requirement 28. What also proves that the kit is moving in the right direction is that the first iteration with 5 participants proved challenging with frequent facilitator interventions to achieve success. However, the second iteration with a group of 10 participants, who also had a wider range of cognitive levels, succeeded with much less interventions despite the doubled group size. This shift demonstrates improvement, as an unchanged or poorly adapted approach with a larger group would typically have amplified the difficulties.

Three observations stood out as particularly significant. First, the cognitive range within the group of ten participants was wider than in Iteration 1 and the toolkit accommodated this range reasonably well. Participants with a higher level worked more independently whilst participants with a lower level could still participate meaningfully with minimal support. Second, the moment of agency of display was stronger and more spontaneous in this iteration, suggesting that the DIY activity reliably triggers pride of authorship. Third, the fact that some participants began helping others after finishing early is a direct expression of the Do-It-Together mindset described by Hedditch and Vyas (2025) in Chapter 5.1, an outcome that was not designed for but emerged naturally from the activity.

Two areas of friction remain. The balance between enough instruction and too much instruction has not yet been fully finetuned, both in the video and in the printed booklet. The stapling step, whilst much improved, still requires an initial

Measure	Iteration 1 (n=5)	Iteration 2 (n=10)	Change
Pride of authorship (VAS)	5 out of 5 chose happiest face	10 out of 10 chose happiest face	Consistent
Agency of display	5 out of 5 wanted to show someone creation	10 out of 10 wanted to show someone creation	Consistent
Willingness to repeat	5 out of 5	8 out of 10	Consistent
Perceived difficulty	3 out of 5 found it difficult	0 out of 10 found it difficult	Improved
Perceived independence	2 full, 1 partial, 2 not alone	Most independently, some with minimal help	Improved
Instructions easy to follow	4 easy, 1 relatively easy	All found them clear	Improved
Learned new skills	4 out of 5	All participants	Improved
Facilitator interventions	Fewer than 5 times	1 to 2 times on average	Improved
Observed bottlenecks Steps requiring facilitator help	Stencil cutting (5/5), stapling (2/5), frame orientation, nested shapes	Frame construction help with first staples, stencil cutting (some)	Reduced
Choice card system	Colour coding to all self-evident	Some lower-level participants selected multiple cards	Reduced
Spontaneous agency of display	"I even had tears of joy"	"I am so proud!!!"	Consistent

Figure 33: Overview of results from participants self-evaluation.

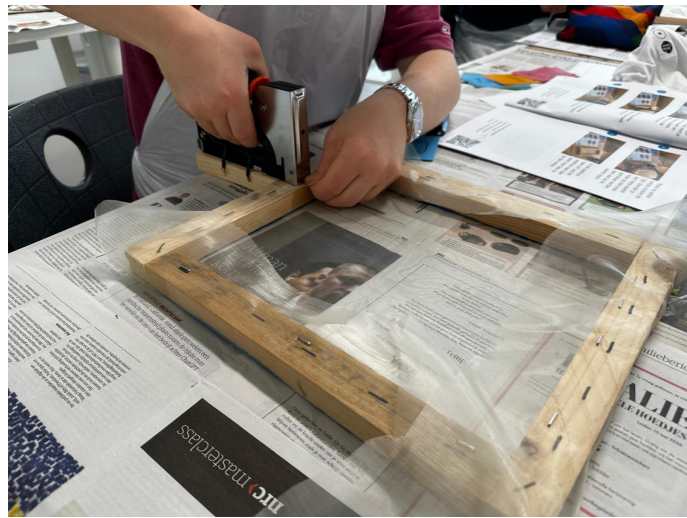


Figure 34: Participant stapling the mesh to the wooden frame independently.



Figure 35: Participant using the squeegee to create print on T-shirt.



Figure 36: A very happy and proud participant.



68 Figure 37: Overview of results from second round of testing.

Implications for the final concept

The following changes will be carried forward into the final concept.

- » The choice cards will be made from a thicker material so they are easier to pick up and handle, addressing the physical accessibility issue observed in this iteration. A placemat, integrated into the design of the box lid, will be introduced to make the one-card-per-colour selection rule physically self-evident. Each colour category will have a designated spot on the placemat where exactly one card can be placed, removing the need for the user to remember the rule and making an incorrect selection immediately visible. This design introduces even more errorless learning. The placemat also functions as a cutting mat during the stencil preparation step, meaning no separate cutting mat is needed and the box lid serves multiple purposes across the making process. This element still needs to be tested in a future iteration.
- » The instructional video and printed booklet will be reviewed once more to find the right balance between sufficient and excessive information. The goal is to provide exactly enough guidance for the user to proceed independently at each step without the volume of information becoming overwhelming for participants with a shorter attention span or reduced working memory.
- » The language in the instructions will be reviewed and further simplified. Words that teachers identified as too complex, such as “ontwerp”, will be replaced with simpler alternatives.
- » The instruction booklet will be laminated. During both iterations it became clear that some participants needed a small additional explanation or a concrete example at certain steps, for instance, when spelling out a word for their design. A laminated booklet allows the facilitating teacher or parent to write directly onto the page using a whiteboard marker to add a personalised note or example and then wipe it clean afterwards if wished. This means the booklet can be adapted to the individual user at any moment without permanently altering the instructions, supporting the range of cognitive levels observed across both test groups whilst keeping the booklet reusable across multiple sessions.
- » All components, the wooden frame, the choice cards, the placemat, the instruction booklet, the stencil materials, the paint, the squeegee and the printed object, will be contained within a laser-cut wooden box that doubles as

the working surface. This box is the physical embodiment of the toolkit and its design ensures that everything the user needs is in one place, clearly organised and ready to use to minimise working memory and overwhelm.

DELIVER

Description of Final concept

The concept is described in detail using both words, images and a user journey.

Market Analysis

Other players in the market are described and the market size is estimated.

Guidelines

Guidelines and insights for other designers are described.

Discussion

Exploring the meaning and relevance of research results

Conclusion

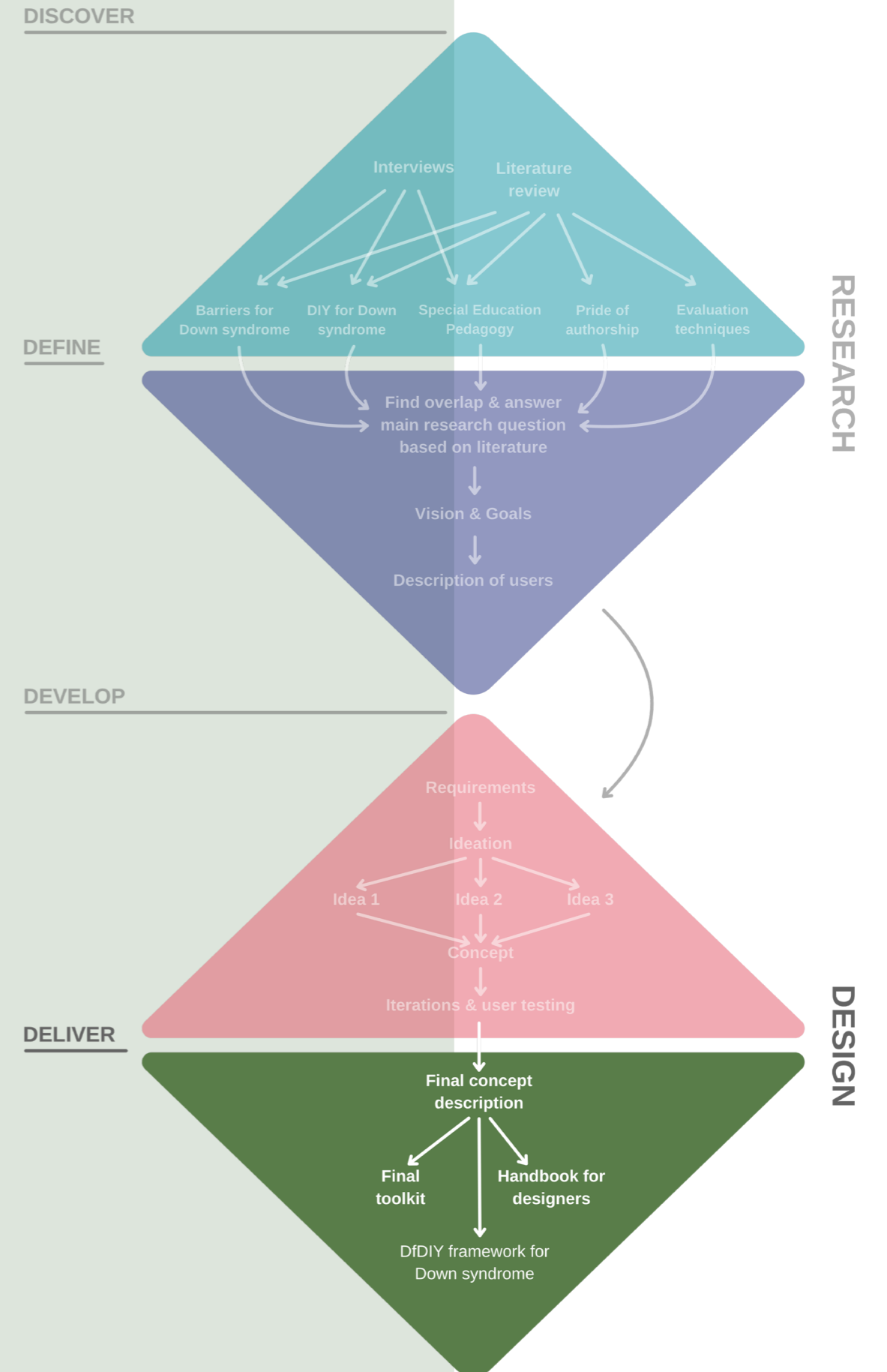
Summarising findings and answering main research question

Recommendations

Recommendations for future designs and researches are made.

Reflection

Reflecting on the thesis, design and research process.



11. DESCRIPTION OF FINAL CONCEPT

DOWN TO MAKE

11.1. Down To Make

A DfDIY buildkit for makers with Down syndrome

Down to Make is a brand that will develop and produce build kits for young adults with Down syndrome (see figure 38). Each kit will enable users to independently learn a new making skill, whether cognitive, physical or both, produce a professional-quality artefact and experience a genuine sense of pride of authorship. The kits will not be therapeutic activities or occupational crafts. They will be real making experiences that teach real skills and place the user at the centre of the design process, giving them a say in what they make, how it looks and what it becomes.

The screen-printing kit described in this project is the first kit in the Down to Make range and served as the case study through which the core methodology was developed and tested. The purpose of this case study was not to create a screen-printing product in isolation, but to develop and validate a set of principles for instructional design, choice-based co-creation, tool adaptation and evaluation that can be applied to any making technique. These principles were tested against the key aims of this project: democracy in design, skill acquisition, pride of authorship and independence. All four were demonstrated to work in practice across two rounds of user testing. The methodology that emerged from this process now forms the foundation of the Down to Make system and can be applied to a wide range of future kits, from linocut printing and textile assembly to woodworking, electronics and beyond.



Figure 38:
Contents of
Screenprinting
Down to Make
buildkit.

The box

Every Down to Make kit arrives in a laser-cut wooden box. The lid of the box slides out, once removed it is placed flat on the table to become the placemat and working surface for the activity. The working surface is the underside of the lid. This makes the box multifunctional across every kit: it stores and protects all components during shipping, it structures the choice-making process via the placemat and it serves as a working area for any activity. The box is designed to look and feel like a premium product, not a school supply or a therapeutic aid. This applies the aesthetic scaffolding principle, ensuring that the toolkit communicates quality and competence before the user has even begun making. The Down to Make box is designed to avoid the therapeutic or medical look that can signal disability (see figure 39).



Figure 39: The Down to Make buildkit box.

The placemat

The placemat is the inside surface of the box lid. Once the lid is slid out and placed flat on the table it immediately becomes the working surface for the activity. It serves two functions in the kit. First, it is the surface on which the user places their choice cards at the start of the activity. Each colour category has a clearly designated spot engraved in the placemat, so the user physically places one card per spot. This makes the one-card-per-colour rule self-evident without any verbal explanation, applying errorless learning directly to the decision-making process. Rather than asking the user to remember a rule, the design of the placemat makes the correct action the only obvious action. The user can see immediately where things go and what to do first, reducing the extraneous cognitive load. Second, it functions as a working area for any activity (see figure 40).



Figure 40: The Down to Make placemat.

The choice cards

The choice cards are one of the first things the user interacts with in every kit. They are made from 3 mm acrylic so they are easy to pick up and handle, addressing the fine motor accessibility issue observed in both test iterations. The cards are colour-coded by category and the specific categories vary per kit depending on the making technique. The cards are made with icons and text to provide the user multiple means of representation. The cards use Verdana throughout, a sans-serif typeface recommended for people with neurodiverse cognitive profiles. In every kit, the user selects one card from each colour group and places it on the designated spot on the placemat (see figure 41, 42 and the appendix for the full set of cards).



Figure 41: The Down to Make choice cards.

This tangible, physical selection process is a direct application of what the literature describes as the tangible turn in co-design, the shift away from abstract verbal decision-making towards physical, concrete choice-making that is genuinely accessible to people with intellectual disabilities. Rather than asking the user what they want to make in an abstract manner, the cards present visual options that can be selected through a physical action. This gives the user genuine authorship over the outcome from the very first step and directly supports the volition principle from Self-Determination Theory ensuring the user is making rather than complying.



Figure 42: Choice cards spread out.

The instructional video

Every kit includes a full instructional video (QR code on outside of box and in instructions) that the user watches before beginning the activity (see figure 43). This gives the user a complete picture of what is expected before they pick up a single tool, which was identified by teachers in both test iterations as one of the most valuable elements of the toolkit. Seeing the full process in advance allows the user to form a mental model of the activity, directly reducing the sequencing and planning demands that are identified as a primary barrier for this target group. The video is kept as concise as possible whilst remaining complete, to accommodate the shorter attention spans and reduced working memory of the target group. QR codes in the instruction booklet link directly to the relevant timestamp in the video for each step, so the user can refer back to a specific moment without having to search through the full video. Together the video, the booklet and the embedded physical instructions in components of the buildkit provide the same information through multiple simultaneous channels, applying the Multiple Means of Representation principle from the Universal Design for Learning framework discussed in Chapter 5.3 (see figure 44).



Figure 43: QR code for instructional video on lid of box.

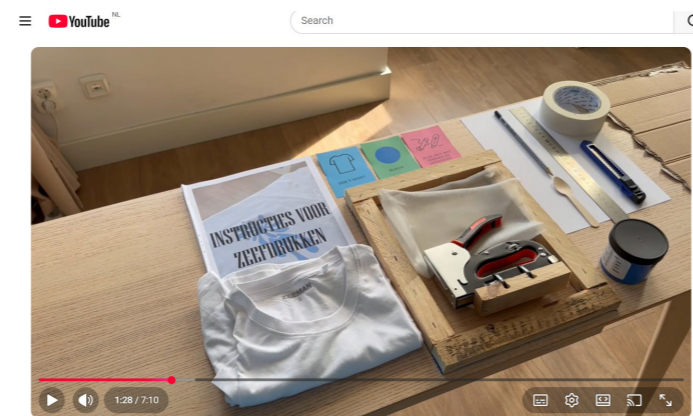


Figure 44: Instructional video on YouTube.

The instruction booklet

The instruction booklet is a bound, laminated document with three steps per page, based on the structure of 'Kijk ik kook' (Weuts, n.d.), a cookbook designed for readers with Down syndrome (see figure 45). The 3 step per page format allows the user to see upcoming steps without losing their place, supporting anticipation of the process without requiring the user to hold information in working memory, directly addressing the cognitive load challenge that these users experience. The laminated pages allow a teacher or parent to write directly onto the page with a whiteboard marker, adding a personalised note, an example or a clarification for a specific user, and then wipe it clean afterwards. This makes the booklet adaptable to the full range of cognitive levels within the target group by having the option to provide more support, whilst



Figure 45: Laminated instructions for screen printing.

remaining reusable across multiple sessions.

The booklet uses Verdana throughout, a sans-serif typeface recommended for people with neurodiverse cognitive profiles. All sentences contain a single action only. Pronouns such as "it" or "this" are replaced with the explicit name of the object being referenced, ensuring the user never has to hold a referent in working memory across sentences. Self-check moments are embedded at key points so the user can confirm their progress independently, supporting the errorless learning principle by allowing mistakes to be caught and corrected before they compound. The language has been reviewed to remove unnecessarily complex vocabulary, replacing difficult words with simpler alternatives or supporting them with an image. The booklet is visually calm, structured and adult in aesthetic, it does not look childlike (see figure 46 and the appendix for the full instructions).

The subscription model, future kits and webshop

The Down to Make subscription will deliver a new kit every two months, with six kits forming a full year of making. Across these six kits, the level of scaffolding is explicitly reduced and the degree of design freedom is explicitly increased, so the user experiences genuine skill development over time. The first two kits will focus on skill acquisition with a high level of support. The middle two will introduce more design freedom and less step-by-step guidance. The final two will invite the user to apply the technique to a self-chosen project with minimal embedded support. This progressive reduction of scaffolding across the curriculum is a direct application of the scaffolding framework from Chapter 5.3 at the system level, ensuring that independence is not just experienced within a single session but grows over time. This structure is also a direct application of Csikszentmihalyi's (1990) challenge-skill balance as described in Chapter 5.4. As the user's skill grows across the curriculum, the challenge rises with it through increased design freedom and reduced support, keeping the maker within the flow channel over time and preventing the drift into boredom that repetitive activities produce for this group. After completing year one, a second curriculum will introduce a new making technique using the same buildkit system and method.

The toolkit will be available as a one-off purchase or as a bi-monthly subscription, sold directly via the Down to Make webshop. The webshop is itself will be designed to be accessible, with image-led navigation and simple language consistent with the toolkit's design principles. Institutional classroom sets will be available for VSO and ZML schools and day-activity providers (see figure 47).



Figure 46: Instructions for screen printing. Layout based on 'Kijk ik kook'.

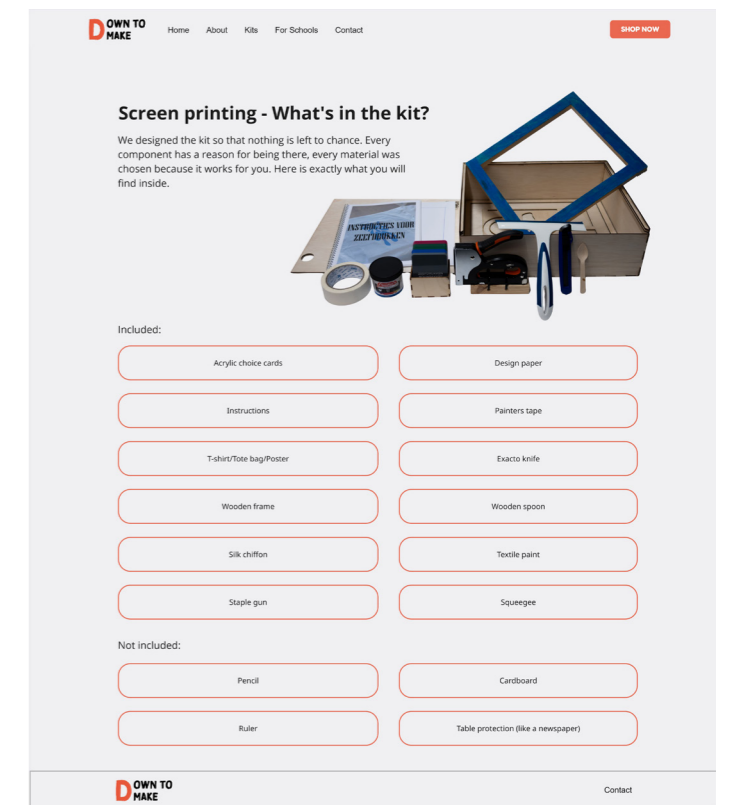


Figure 47: Example of what the Down to Make webshop could look like. A 'What's in the kit?' page.

11.2. Screen-printing buildkit: a case study

The screen-printing kit is the first kit produced under the Down to Make system and the case study through which the methodology described in the previous section was developed and validated. Screen-printing was selected as the case study because it scored highest in the Harris profile evaluation against the six most important requirements for the build kit, and because teachers from the partner education initiatives identified it as the concept most likely to engage the target group, produce a visible sense of accomplishment and generate an artefact of genuine quality. The full selection process is described in Chapter 9.2.

The physical components

The screen-printing kit contains the following components: a wooden frame, a piece of silk chiffon mesh, a shower squeegee, a staple gun with a wooden support block, textile paint in five colours, masking tape, thick paper for stencil making, pre-cut laser stencil options and the blank object to be printed on, whether a t-shirt, tote bag or poster paper. All of these sit neatly inside the wooden box (see figure 48).



Figure 48: Inside the box.

The physical components have been adapted to the motor profile of the target group throughout. The wooden frame has one side painted blue to indicate orientation and staple placement markings on the opposite side to show exactly where each staple should go. These are direct applications of the embedded instruction principle discussed in Chapter 5.3, where guidance is physically integrated into the tool or environment itself rather than communicated through a separate instruction.

The wooden support block is placed beneath the staple gun, stabilising the action and making it safer and more manageable for users with low muscle tone. This follows the Bespoke DIY-AT principle described in Chapter 5.2, adapting a standard tool rather than replacing it with specialist equipment that looks and feels therapeutic.

The choice cards for screen-printing

For the screen-printing kit, the choice cards are organised into three colour-coded categories: the object to be printed on, the paint colour and the design. The user selects one card from each category and places it on the designated spot on the placemat. For the design category, the user can choose between pre-made laser-cut stencil options or design their own. For users who choose to design their own stencil, a bordered drawing template is included in the kit. A border defines the maximum drawable area and a small set of example shapes illustrates an appropriate level of design

complexity. This externalises the spatial requirements that participants failed to realise independently during testing.

The making process

The user begins by scanning the QR code on top of the box to watch the instructional video in full. The user then slides out the box lid, turns it over and places it flat on the table as the placemat. They place their choice cards on the designated spots and make their three decisions: what to print on, what colour to use and what design to print. They then work through the instruction booklet step by step: stretching the mesh over the frame and stapling it in place using the support block, preparing their stencil by drawing within the bordered template and cutting it out on the placemat, taping the stencil to the frame, laying the blank object flat on the table,

positioning the frame and pulling the squeegee across in a single firm stroke. They lift the frame. Their design is on the object (see figure 49).

Every step in the process has been designed so that the user can complete it themselves. The scaffolding is embedded in the tools, the frame and the instructions rather than in the presence of a facilitator. The facilitator is there if needed, especially for lower cognitive profiles. As observed in both test iterations, participants consistently achieved more independently than their teachers and caregivers had expected. The moment of revealing the finished object produced spontaneous and genuine expressions of pride every time, the clearest possible evidence of agency of display as described in Chapter 5.4.

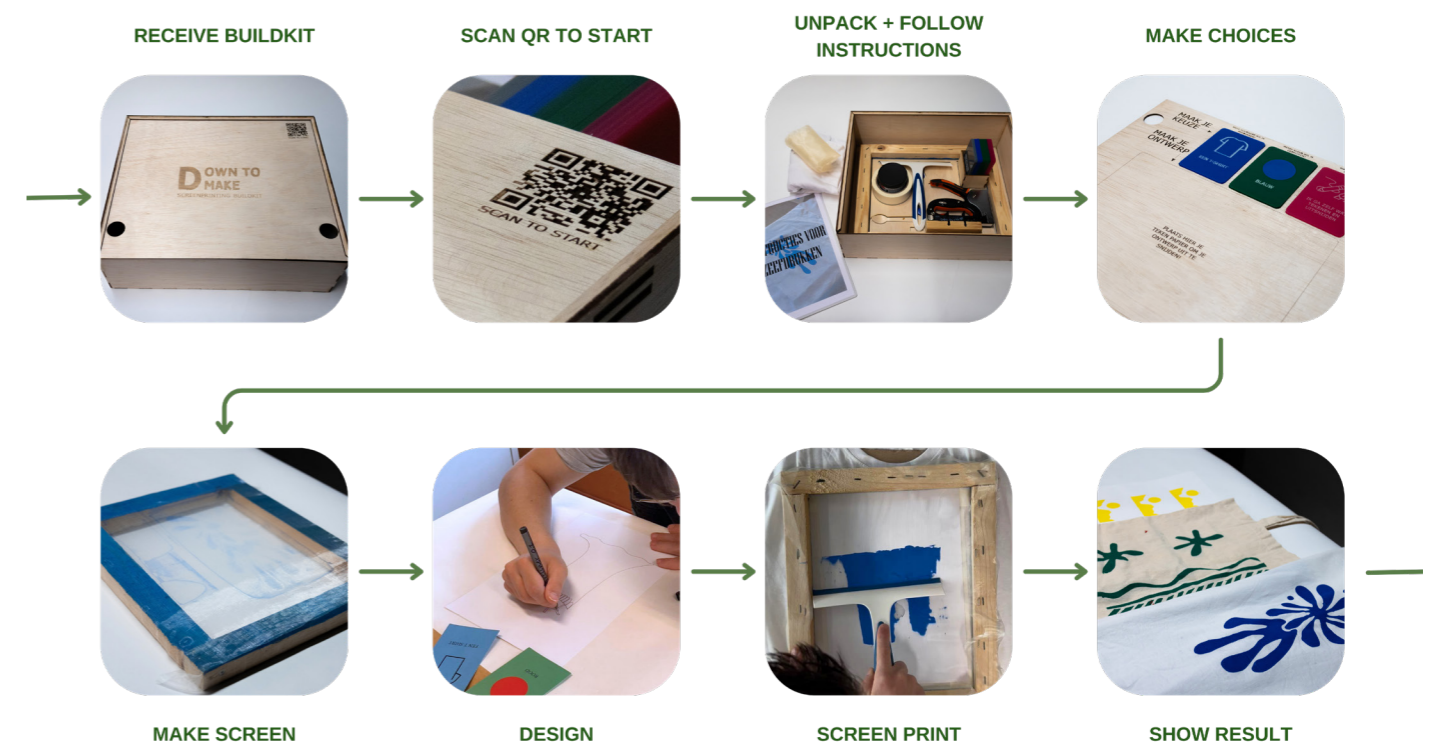


Figure 49: The making process described in images.

User journey

The user journey map below (see figure 50) visualises the experience of the persona Lars, a 21-year-old with Down syndrome, as he uses the toolkit at home. The journey runs from the moment the kit is ordered through to the moment he shows off his finished product. Eight stages are mapped, moving from discovery and unboxing through the making process to the final moment of pride of authorship. Below each stage, the emotional experience is tracked through points ranked from high to low emotional experience. This reflects

the shift from curiosity at the start to pride and anticipation at the end. The pain points identified per stage, directly inform the design decisions made across the three iterations. Although the journey shown here is set in a home context, it is nearly identical in a school setting, with the parent replaced by a teacher as the facilitating stakeholder and the webshop ordering step replaced by an institutional purchase.

User Journey Map

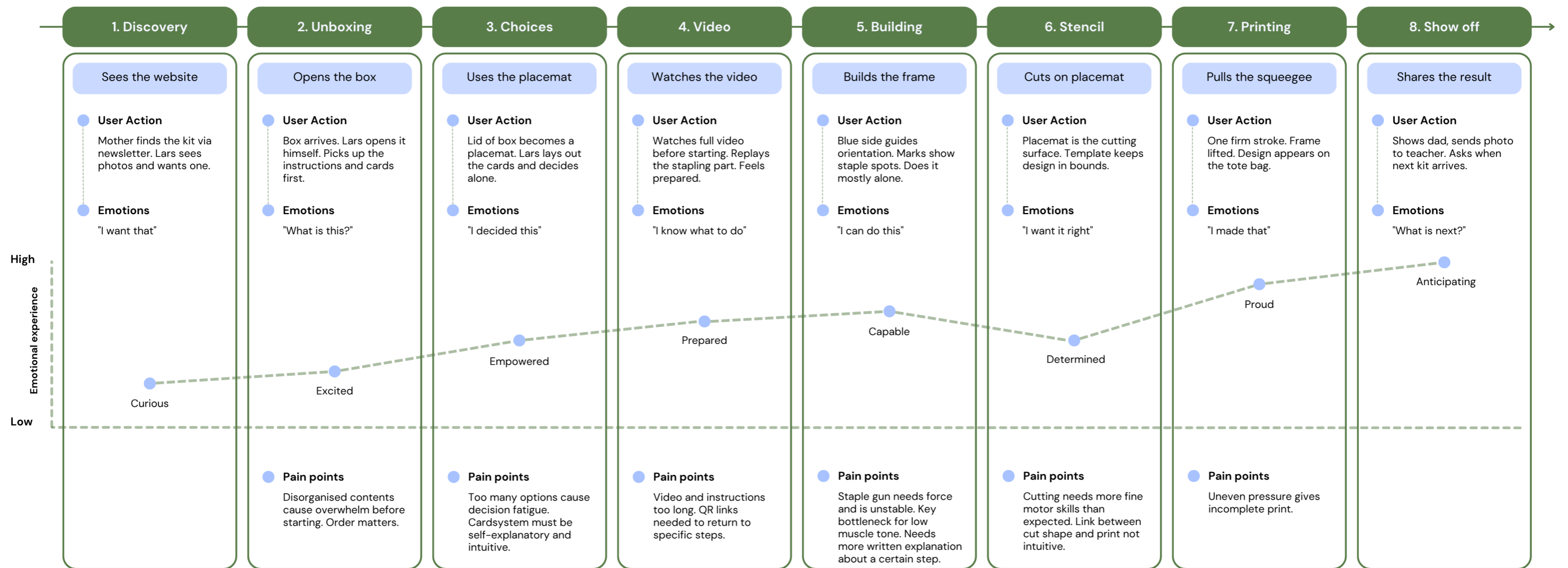


Figure 50: User journey map visualising persona Lars' experience with the Down To Make screen printing buildkit in a home setting.

12. MARKET ANALYSIS

This chapter examines the commercial viability of the toolkit by addressing four questions:

1. How large is the potential market?
2. Who are the relevant competitors?
3. What would a single kit reasonably cost to produce and sell?
4. Through which business model can the toolkit reach its users?

The Netherlands is treated as the launch market. The analysis then widens to Europe and the global picture to estimate longer-term reach.

12.1. Market Size

The market size is estimated using the TAM, SAM, SOM framework (see figure 51).

Total Addressable Market (TAM)

Globally, the population of people living with Down syndrome is estimated at approximately six million, with around 175,000 children born with the condition each year (Global Down syndrome Foundation, 2024). The average life expectancy for individuals with Down syndrome is approximately 60 years (Ramirez, 2024). Assuming a simplified uniform age distribution across this lifespan, the 17-60 age band represents 43 out of 60 years, or approximately 72% of the total population. Applying a conservative correction downward to approximately 65%, to account for historically higher early mortality rates primarily associated with congenital heart conditions, yields a global TAM of roughly 3,900,000 individuals (6,000,000 × 65%). It should be noted that this remains an approximation, as the age distribution of people with Down syndrome is not perfectly uniform (De Graaf et al., 2020).

Serviceable Available Market (SAM)

As of 2015, approximately 419,000 people with Down syndrome were living in Europe (De Graaf et al., 2020). Applying the same 65% correction gives a European SAM of approximately 272,000 individuals.

Serviceable Obtainable Market (SOM)

Using the Netherlands as a launch market. Stichting

Downsyndroom estimates that approximately 13,000 people with Down syndrome live in the Netherlands (Stichting Downsyndroom, 2024), with approximately 275 babies with Down syndrome born in the Netherlands each year (Stichting Downsyndroom - Kern Amsterdam, n.d.). Applying the same 65% correction yields an estimated Dutch SOM of approximately 8,000-9,000 individuals. A realistic three-year reach of 1%-5% (Kader, n.d.) of this SOM gives an initial obtainable customer base of approximately 80-450 individual subscribers, supplemented by 20-40 institutional placements. The toolkit's structure is not inherently limited to the tested age group of 17-25. Adults beyond 25 with Down syndrome who have an interest in making and skill development represent a plausible extension of the addressable market, which is why the broader 17-60 figures are used at TAM, SAM and SOM level.

It is worth noting that the toolkit's design principles, accessible components, embedded instructions, scaffolded support and pride-of-authorship outcomes, are not exclusive to Down syndrome. The wider population of people with mild to moderate intellectual disabilities in the Netherlands is substantially larger and the same toolkit could in principle serve adjacent groups without significant redesign. This adjacency is treated as a future expansion opportunity rather than included in the SOM figures above.

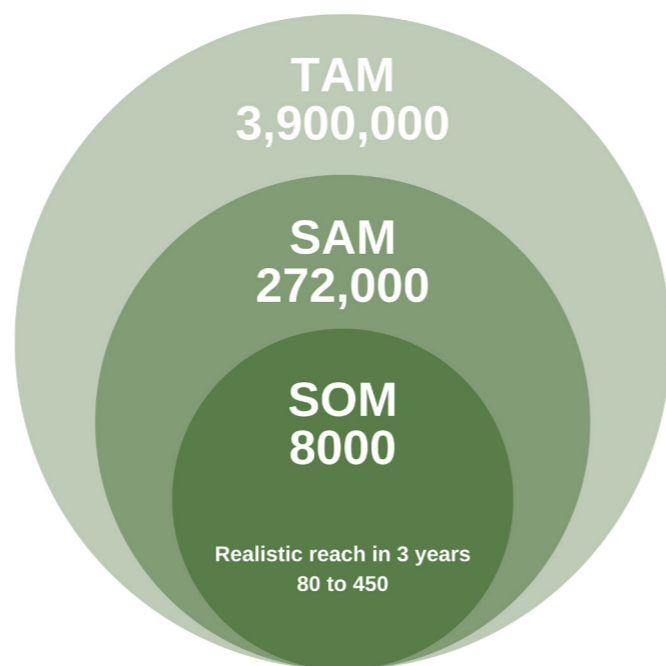


Figure 51: Overview of TAM, SAM, SOM in amount of people.

12.2. Pricing

All prices listed below are inclusive of 21% VAT. Costs Of Goods Sold (COGS) figures are exclusive of VAT. This distinction is important for margin calculation: a kit retailing at €55 inclusive of VAT returns €45.45 net, meaning the effective margin is calculated against the net figure rather than the retail price.

Regarding packaging and shipping: the laser-cut wooden box, whilst adding significantly to the perceived quality and reusability of the kit, results in a package that exceeds standard letterbox dimensions. Shipping within the Netherlands therefore requires a parcel service rather than letterbox delivery, at an estimated cost of €5-6 per shipment (PostNL, 2025). This has been calculated into the COGS table below.

The table below summarises the estimated Cost Of Goods

Sold per kit, based on standard Dutch material prices. Costs were estimated using pricing from Dutch suppliers including Zeefdrukland (2025) for screen-printing materials, Bol.com (2025) for staple guns and squeegees, Drukwerkdeal (2025) for printed booklets and PostNL (2025) for shipping. All figures are first-order estimates. Actual costs should be confirmed via supplier quotes before commercial sale.

The first kit also includes a one-off starter pack containing the staple gun, full squeegee and frame template, with an additional COGS of approximately €10-15.

These prices position the toolkit well below Zeefdrukland's entry-level Mini Set (€99) and Starter Set (€109.99) (Zeefdrukland, 2025), whilst offering cognitive and physical accessibility. It should be noted that these are rough estimations and that further research should be done into these numbers and how they change when larger batches are made (see figures 52 and 53).

Component	Estimated COGS (excl. VAT)
Laser-cut wooden frame and silk chiffon mesh, pre-marked	€4-6
Textile paint (5 colours)	€2-3
Squeegee	€2-4
Stencil materials (thick cartridge paper, pre-cut via laser cutter)	€1-2
Masking tape, wooden support block and miscellaneous	€2-3
Blank object to print on (T-shirt, tote bag or poster paper)	€3-5
Printed instruction booklet	€2-3
Laser-cut acrylic choice cards (reusable)	€2-3
Laser-cut wooden box (packaging/storage/use in making)	€5-8
Parcel shipping within the Netherlands	€5-6
Total estimated COGS (excl. VAT)	€28-43 (midpoint ~€35)

Figure 52: Overview of estimation of COGS.

Product type	Retail price (incl. 21% VAT)	Net price (excl. VAT)	Est. COGS	Est. gross margin
One-off single kit	€65-75	€54-62	€45-50	~15-20%
Bi-monthly subscription	€50-55 per kit	€41-45	€35-40	~10-20%
First subscription shipment (incl. starter pack)	€70-75	€58-62	€45-55	~10-15%
Classroom set (8-10 students)	€380-450	€314-372	€200-260	~25-35%

Figure 53: Overview of estimation of price per product type.

12.3. Competitor Analysis

The competitive landscape is separated into three categories: generic STEM build-kits, adaptive products for people with cognitive or physical disability and generic screen-printing starter kits. None of these individually combines the designed buildkit's full value proposition. No directly comparable Dutch subscription build-kit currently exists, making CrunchLabs and KiwiCo the closest commercial reference points internationally. The table below maps the key criteria across this toolkit and its two largest commercial comparators (see figure 54 and 55).

The buildkit proposed in this project (Down To Make) occupies an unoccupied position in this market landscape: it combines the subscription model and progressive skill arc of CrunchLabs and KiwiCo with the cognitive accessibility of adaptive product design, applied to the maker domain. In the competitor matrix some of the most important and largest competitors are shown to give an indication of what exists where.

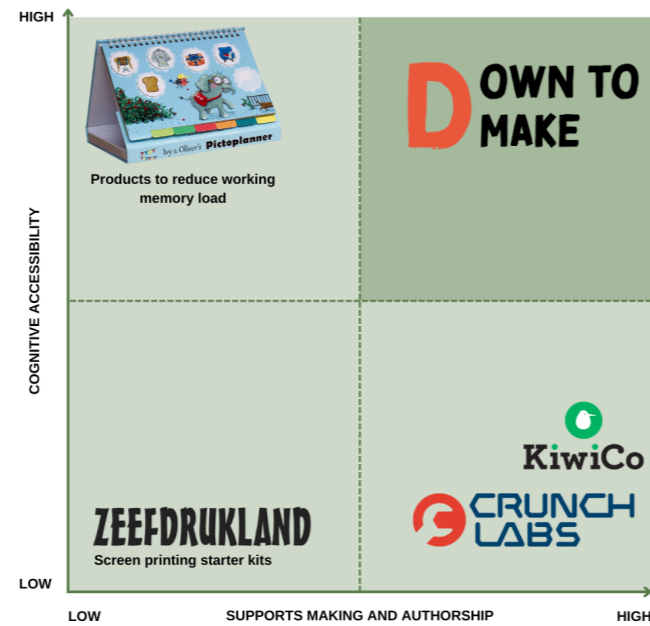


Figure 54: Competitor matrix.

Criteria	Down To Make	CrunchLabs	KiwiCo
Target user	Adults (17-60) with Down syndrome	Children (8-14), neurotypical	All ages, neurotypical
Cognitive accessibility	High	None	None
Co-creation / user input	High	None	None
Scaffolding framework	Progressive, reduced over 6 kits	None	None
Quality of final artefact	Medium	Medium	Medium
Subscription model	Bi-monthly, progressive curriculum	Monthly	Monthly
Price per kit (incl. VAT)	~€50-55	~\$29.99/month (~€28)	~\$19.95-24.95/month (~€19-23)
Designed for intellectual disability	Yes	No	No

Figure 55: Comparator table ranked across criteria of the buildkit.

12.4. Business Model

The business model consists of three revenue streams, each addressing a different user context identified in Chapter 8.

The bi-monthly subscription is the primary product, sold directly via the webshop. It is structured as a rolling subscription that can be cancelled at any time, built around a six-kit curriculum per year. Across these six kits, scaffolding is removed progressively in every kit and design freedom is increased progressively in every kit. The first two kits focus on gaining skills with a higher level of support. The middle two introduce more and more design freedom and less step-by-step guidance. The final two invite the user to apply the skill being taught with that buildkit to a self-chosen project with minimal support. After completing year one, a second curriculum can introduce other techniques such as linocut printing, basic textile work or electrical circuits.

The one-off purchase allows individuals, parents or schools to buy a single kit without committing to a subscription, serving as a low-risk entry point and a gift option.

The institutional licence offers schools and day-activity centres a classroom set, targeting VSO and ZML schools and day-activity (dagbesteding) providers.

It is important to note that whilst the user is the young adult with Down syndrome, the person making the purchase is most often a parent, legal guardian or care institution. Marketing and outreach should therefore be directed at parents and guardians, positioning the toolkit as both a development resource and a meaningful and enjoyable activity.

12.5. Distribution

All sales take place via the webshop. This is the single point of purchase for both individual and institutional customers, which keeps the brand identity consistent and avoids losing margin through third-party retailers. The webshop itself must also be accessible, with image-led navigation and a simple checkout process that reflects the same design principles as the toolkit.

Brand awareness is built through three channels. Partnerships with specialist education initiatives provide a direct route to institutional customers and a trustworthy endorsement. Advocacy organisations such as Stichting Downsyndroom offer access to engaged parents and families through the Down+Up magazine and events such as World Down syndrome day. Care institutions such as Pameijer and ASVZ provide a further referral route for day-activity centers. These partnerships are awareness and referral channels only. All purchases are completed via the webshop. For examples of what the webshop could look like see the images in figure 56.

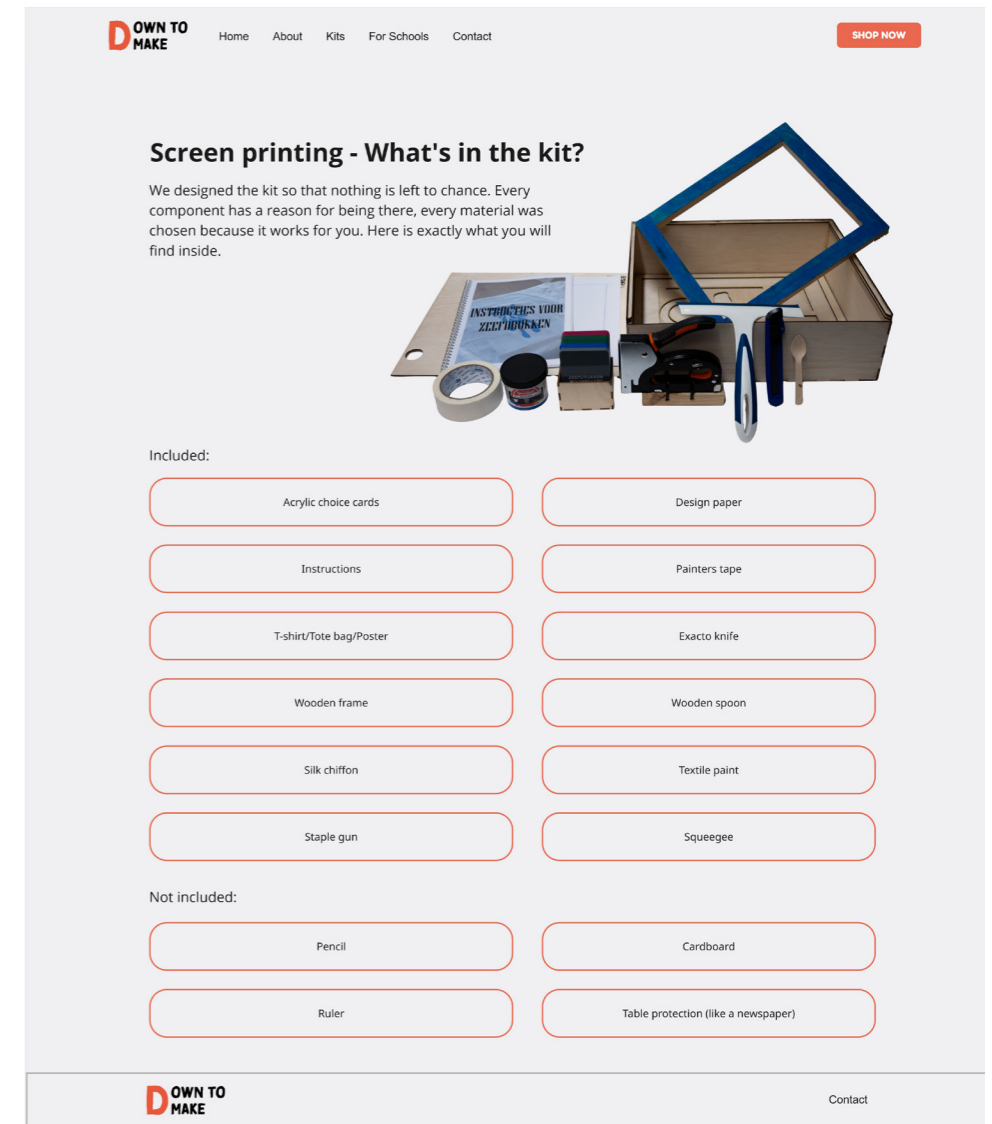
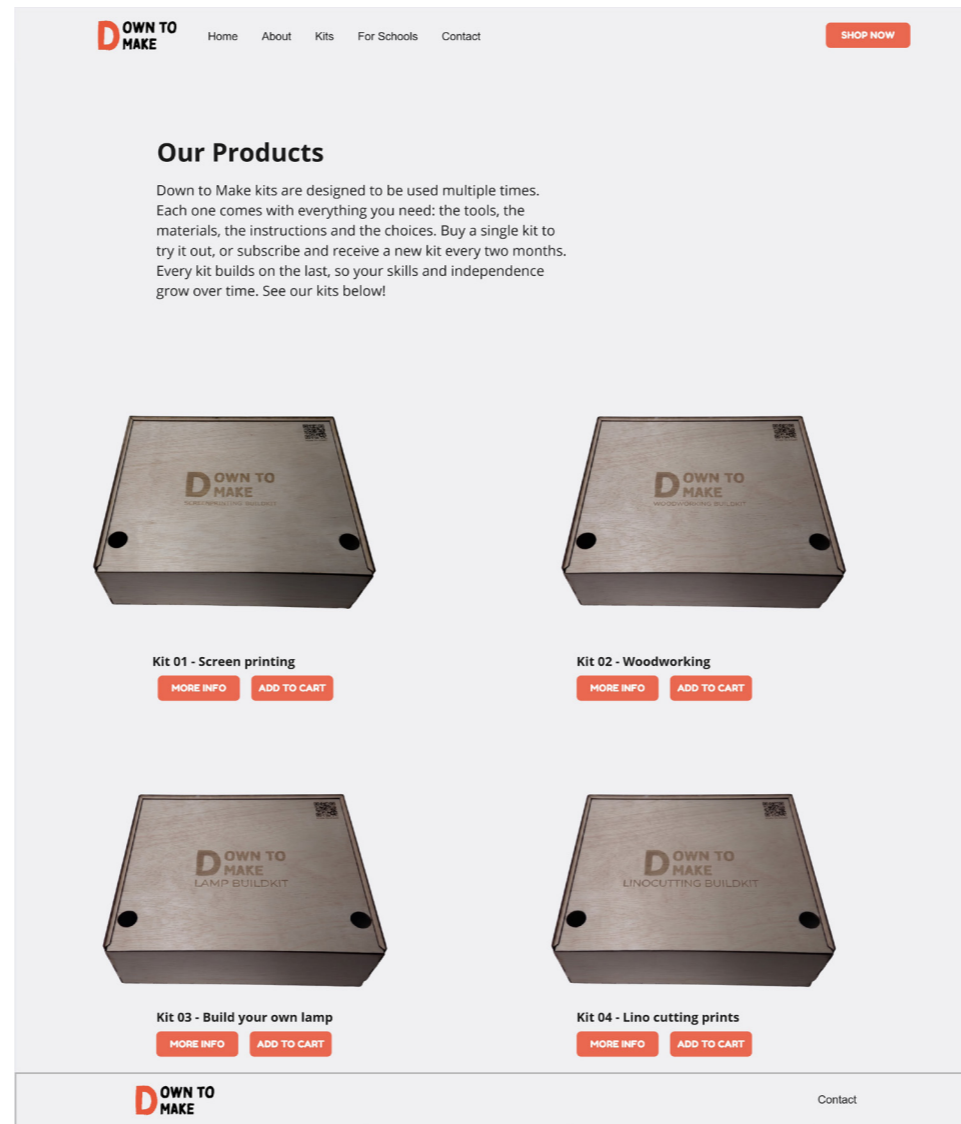
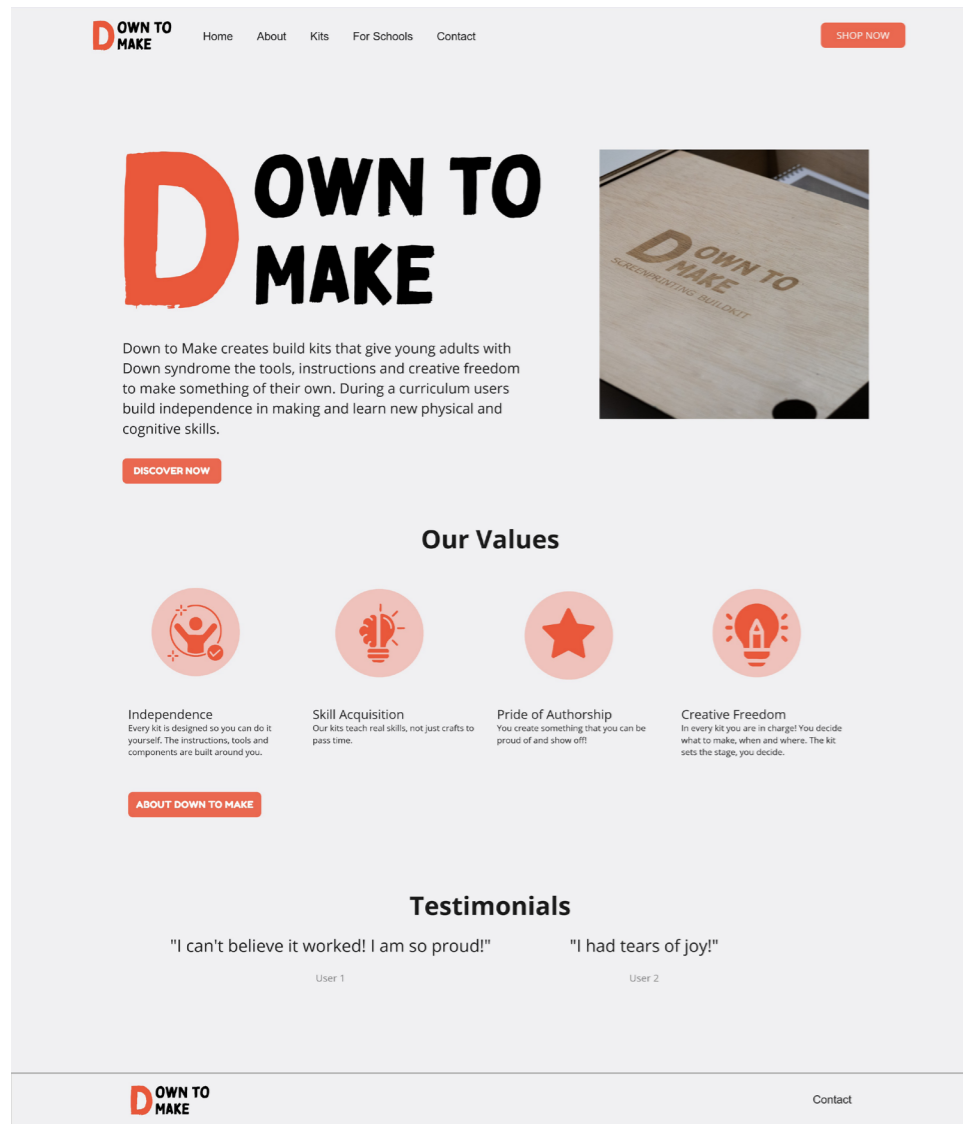


Figure 56: Example of what the webshop of Down to Make could look like.

13. GUIDELINES FOR DESIGNING AN INCLUSIVE DF/DIY BUILDKIT

13.1. A handbook for designers creating making kits for (young) adults with Down syndrome

These guidelines are a practical starting point for any designer developing a buildkit that enables (young) adults with Down syndrome to independently learn a new making skill, produce a high-quality artefact, and experience a genuine sense of pride of authorship and autonomy. They are organised into three clusters: choosing what the user will make, designing the kit and facilitating the session. Each guideline stands alone, no prior knowledge of the research behind them is needed to apply them (see figure 57 for a visual guide).

13.2. Cluster 1: Choosing what the user will make

- 1. Choose an activity that produces a tangible, displayable result.** The final artefact should be something the user can wear, display, or give as a gift. This is what makes pride of authorship tangible and observable.
- 2. Choose an activity where fine motor precision is not essential to the core action.** Map every step and ask: does this require pinching, threading, or handling objects smaller than 2cm? If yes and the step cannot be redesigned, choose a different activity or change the design so that the object is larger than 2cm.
- 3. Choose an activity that contains natural choice points.** The user must make genuine decisions about the outcome, for example what material, what colour, what design. If you cannot find natural choice points, the activity is too closed for this format.
- 4. Choose an activity that teaches at least one**

transferable skill. The kit should leave the user with a capability applicable in a different context, such as a work placement or daily life. Doing activities for the sake of doing an activity is not suitable.

- 5. Choose an activity with a clear moment of revelation.** The emotional peak of a making session is the moment the result becomes visible for the first time. Activities that build toward a single visible payoff are far more rewarding to the user than those where the outcome accumulates gradually.
- 6. Avoid activities that require specialist equipment or chemical processing.** Every step must work in a kitchen, on a dining table, or in a school classroom without specialist infrastructure. Test the activity against the question: could a parent set this up at home on a Sunday afternoon?
- 7. Check that the activity is scalable across a range of cognitive levels.** The activity must accommodate a participant who works fully independently and one who needs every step demonstrated, without excluding either. If it only works at one cognitive level, it is too narrow.
- 8. Ensure the final artefact looks professional regardless of the user's fine motor precision.** Choose techniques and materials that are forgiving of imprecise execution. The aesthetic scaffolding lives in your material choices, not in correcting the user's work.
- 9. Design the kit as a scaffolded system where support decreases over time.** In early sessions, a higher level of guidance is appropriate, embedded instructions, facilitator presence, pre-made options. Over time, that support should be deliberately reduced as the user builds confidence and capability. Each new kit or session in a curriculum should ask slightly more of the user than the last, gradually transferring responsibility from the kit to the maker. Independence is not assumed at the start, it is something to build towards.

13.3. Cluster 2: Designing the Kit

The instruction system

- 10. Deliver every instruction through at least two simultaneous channels.** Never rely on a single format. A printed booklet should be accompanied by a video, physical components should carry embedded cues. Users differ in how they learn best, covering multiple channels ensures no participant is excluded by format alone.
- 11. Produce a full instructional video that shows the entire process from start to finish.** This video is watched before the user touches any component, giving them a complete mental model of the activity in advance. Use QR codes in the booklet to link to specific timestamps in the video for reference during making.
- 12. Structure the booklet with three steps per page and a photograph for each step.** Showing three steps per page gives the user enough context to anticipate what is coming without overwhelming them. Each step should be accompanied by a clear photograph of the action being performed, not an illustration, so the user can directly compare what they see on the page to what is in front of them. Use large, legible step numbers and consistent layout across every page so the structure becomes predictable. Use a bound booklet rather than loose pages, which become disordered on the work surface.
- 13. Laminate the instruction booklet.** Lamination allows a facilitator to write personalised notes directly onto the page with a whiteboard marker and wipe them clean afterwards, making the booklet adaptable to the full cognitive range of the group without altering the printed instructions.
- 14. Write each instruction as a single action in a single sentence.** Never combine two actions in one instruction. If you find yourself writing "and then," split it into two separate steps. Users with reduced working memory cannot hold an incomplete action in mind while performing another.
- 15. Replace every pronoun with the explicit name of the object.** Words like "it," "this," and "that" require the reader to hold a reference in memory across sentences. Replace every pronoun with the explicit object name before the booklet goes to print.

16. Use typeface Verdana throughout all instructional and card materials. Verdana is a sans-serif typeface with open letterforms and clear character differentiation, widely recommended for materials aimed at people with neurodiverse cognitive profiles. Use it at a minimum of 14pt in the booklet body.

17. Write in language that is simple but never childlike. Short sentences and common vocabulary are appropriate. A tone that implies the reader needs to be entertained is not. The user is an adult. Read every instruction aloud and ask: would I speak to a 22-year-old colleague this way?

18. Embed self-check moments at key points in the booklet. A self-check prompt, "Does your frame look like the picture?", allows the user to verify progress and catch errors before they pile up, without requiring facilitator input.

19. Embed instructions directly into the physical components. For example, paint one side of a frame to indicate orientation, mark staple positions on the wood, design handles that only fit one way. When the instruction lives in the object, the user does not need to translate between formats, the correct action is self-explanatory.

The choice card system

20. Make the choice cards from a rigid material, not paper. Paper cards are difficult to pick up for users with low muscle tone and no fine motor skills. Cards made from 3mm wood, 3mm acrylic or thick rigid cards are significantly easier to handle and communicate quality.

21. Organise the cards into colour-coded categories with one card per category. Define two to four choice categories, each in a distinct colour. The categories vary per kit depending on the making technique, define them based on where genuine creative decisions exist in the activity.

22. Use a placemat or other card holder system to make the selection rule self-evident. Design a card holder system, with one designated spot per colour category, sized to hold exactly one card. The rule is enforced by the physical design, not by memory or verbal instruction.

23. Include both icons and text on every choice card.

Icons support users with limited reading ability, text reinforces the meaning for those who can read. Use both on every card, in Verdana, with the icon large enough to be identifiable at a glance.

24. Include a pre-made option alongside a make-your-own option in the design category.

Always provide at least two or three pre-made design options for participants who cannot or do not want to design their own. This ensures no participant is blocked from completing the activity while preserving a creative choice.

25. Provide a drawing template with spatial boundaries for participants who design their own.

If required for the making activity, include a bordered template that defines the maximum drawable area and shows two or three example shapes illustrating appropriate complexity. Users will not independently think about spatial constraints such as margins or scale.

The physical components

26. Adapt every tool and step to the motor profile of the user.

No step should require pinching, threading, or handling objects smaller than 2cm. Where a tool requires downward force, add a support block, non-slip mat, or custom jig to stabilise it. Map every physical step before production, flag anything requiring precision grip or tool instability, and redesign those steps before the kit reaches a user.

27. Design the kit so that an incorrect assembly is immediately visible.

Use orientation markings, colour cues, and one-way fitting geometries so a wrongly placed component looks obviously wrong. Avoid situations where an error in an early step is only discovered several steps later.

28. Source base materials that produce a high-quality finish even with imprecise application.

Test every material with intentionally imprecise application and assess whether the result still looks good. If it does not, find a different material.

The packaging

29. Design the box to be multifunctional.

The lid should become the placemat and working surface when removed. A box that stores, structures the choice process, and serves as a working area across the session reduces

setup demands and keeps the workspace organised.

30. Design the packaging to look like a premium product, not a therapeutic aid.

A box that looks medical signals assistive equipment. A box that looks designed signals a real making experience. Apply the same design attention to the packaging as you would to any consumer product, it is the first thing the user sees.

31. Ensure every component has a designated place inside the box.

Every component should have a clearly defined position, a cut-out, a divider, a labelled zone, so that unpacking is self-guided and repacking is possible independently between sessions.

32. Design for aesthetic quality throughout, in the kit and in the artefact.

If the finished object looks rough or childlike, observers will attribute that to the maker's disability rather than to the kit's design. Choose forgiving techniques and high-quality base materials that mask inaccuracy without removing genuine creative contribution. Apply the same thinking to the kit itself: use modern colours, considered proportions, and materials the user would be proud to have on their shelf.

13.4. Cluster 3: Facilitating the Session

33. Keep your hands behind your back, and do not intervene at the first sign of hesitation.

This demographic is accustomed to receiving help quickly, which can mask their actual level of independence. When a participant hesitates or asks for help, wait before responding. They may discover they are more capable than either they or their caregiver expected. Using hands behind the back works well as a physical reminder not to intervene prematurely. If a participant is genuinely struggling after giving them time, guide them through the step once. After that single guided attempt, step back and ask them to try the next repetition independently. Continuing to assist beyond that removes the opportunity for genuine skill acquisition.

34. Wait at least twenty seconds before repeating a prompt.

After giving an instruction or asking a question, pause. Users with Down syndrome often have a processing delay between receiving information and responding. Repeating a prompt before this window closes interrupts the processing.

35. Let the participant watch the full video before touching any component.

Do not fast-forward, summarise, or skip the video. It gives the user a complete mental model of the activity before they begin, which directly reduces anxiety and planning demands during the making steps.

36. Use the choice cards to start every session, before any making begins.

Place the placemat flat, lay out the cards, and invite the user to make their selections without suggestions. The selections belong to the user. Once made, keep them visible throughout the session as a reminder of their own decisions. If a participant has a lower cognitive level, ask them to make choices by pointing to the cards.

37. Allow participants to help each other.

In a group setting, do not redirect participants who spontaneously offer to help a peer. Peer support within a making session is a natural expression of collaborative learning and reflects the Do-It-Together mindset that benefits the whole group.

38. Use the laminated booklet to add personalised support without altering the instructions.

Write a simpler word, an example shape, or a personal note directly onto the laminated page with a whiteboard marker, this allows you to wipe it clean. Personalise the experience without changing the kit for everyone.

Evaluating the kit

Evaluate progress using Goal Attainment Scaling (GAS), which sets personalised five-point scales per participant and captures small shifts in independence that standard tests miss. Measure pride through Visual Analogue Scales with illustrated faces and by observing agency of display, does the participant want to show their result, resist putting it down, or tell a peer what they made? During the session, record bottleneck moments and count facilitator interventions. Both decrease over time as the kit improves and skills develop. After a full curriculum, ask caregivers and teachers whether the skills have transferred to other contexts. This social validity check is the most meaningful measure of whether the kit has genuinely advanced independence.

These guidelines were developed through a combination of literature review, semi-structured interviews with special education practitioners, and insights from two rounds of user testing with young adults with Down syndrome aged 17-25. They are intended as a starting point, not a fixed rulebook, document what you observe, iterate on what is not working, and add to these guidelines as you go.

How to design a DfDIY buildkit for Down syndrome

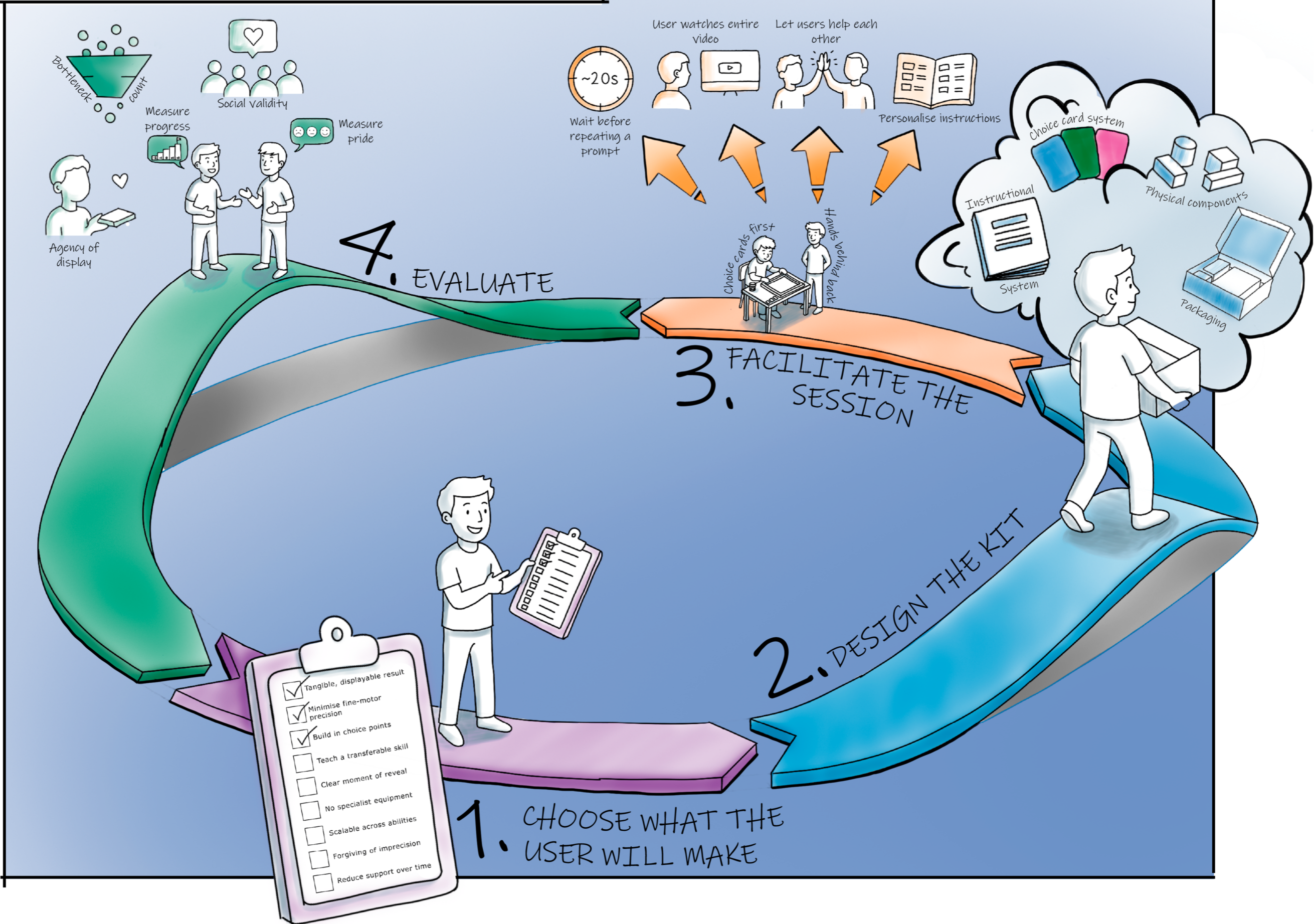


Figure 57: Visual representation of "Guidelines for designing an inclusive DfDIY buildkit".

14. DISCUSSION

The results of this project largely confirmed the theoretical foundations laid out in the literature review, while also bringing up questions and observations that the literature alone could not have anticipated.

The expectation gap

The physical and cognitive barriers identified in the literature review such as hypotonia, reduced fine motor precision, working memory limitations, and sequencing challenges, required concrete design responses, and addressing them formed much of the work of this project. What the testing also surfaced, however, was something less easy to design around: a consistent gap between what participants were expected to be able to do and what they actually did.

In both iterations, teachers independently noted that participants demonstrated more independence than anticipated. One participant completed the second iteration without asking for help at all. Others who finished early began helping classmates, behaviour that had not been designed for and that no one had predicted. It is worth asking what these moments reveal. The Stichting Downsyndroom study (2014) found that nearly 100% of adults with Down syndrome feel underestimated by society. These testing observations seem to reflect that dynamic in a design context: when the environment was structured to support independent action, participants acted independently. Whether this points to a genuine underestimation of this demographic's capability in everyday life, or whether the toolkit simply created unusually favourable conditions, is a question that this project alone cannot fully answer. It does, however, suggest that the relationship between environment design and perceived capability is worth investigating further.

The social function of the artefact

Hoftijzer's DfDIY framework centres on pride of authorship as a personal experience, the satisfaction of having made something. What the testing seemed to suggest is that for this demographic, pride of authorship may have a particularly strong relational dimension. Every participant across both rounds wanted to show their finished object to someone. Participants asked to make a second print as a gift. Spontaneous expressions of pride were directed outward, toward peers, teachers, and parents, rather than inward.

This raises an interesting question about the role of the artefact beyond the making session itself. Holo's (2025) research on the Affirmation Model suggests that a high-quality artefact

can shift an observer's perception of the maker from pity to respect. If that is the case, the toolkit's aesthetic scaffolding, the choice of materials and the quality of the final result, may serve a social function that extends well beyond the session. The finished object travels into the world with the maker and potentially communicates something about their competence to people who were not present. Whether this actually shifts perception in practice, and how durably, is something that would require further research to establish.

The co-creation model

One of the clearest findings from both iterations is the effectiveness of the choice card system as a co-creation tool. All participants engaged actively with the cards, and the colour-coded structure made the selection logic immediately comprehensible without verbal explanation. This aligns with what the literature describes as the tangible turn in co-design, the shift from verbal decision-making to physical choice-making.

What is notable here is not only that the cards worked, but that genuine creative agency, a real say in what gets made and how it looks, was delivered through a physical interaction requiring no verbal articulation. The question this raises for the broader field of participatory design is whether physical choice systems of this kind could replace or supplement verbal co-design methods more widely when working with this demographic, and what that might mean for how co-design workshops are structured.

Scaffolding and the instruction system

The pedagogical framework supporting the toolkit, scaffolded independence through embedded instructions, errorless learning, and multiple means of representation, performed largely as the literature predicted. The reduction in facilitator interventions from fewer than five in Iteration 1 to one or two in Iteration 2 provides concrete evidence that the design changes between iterations were effective.

The instruction system reached a strong baseline across two iterations. Some participants moved through the booklet with ease while others found certain moments more demanding, which is to be expected given the cognitive range within any group. The laminated booklet already offers one solution to this, allowing facilitators to add personalised notes where needed without permanently altering the baseline instructions, ensuring the kit remains textually accessible to lower cognitive profiles while remaining reusable. With

continued testing across more sessions and more diverse groups, the instructions will become increasingly refined finding the exact right balance between the completeness of the instructions and amount of instructions. The instruction balance at the end of iteration 2 is already very good but there is always room to calibrate further, and each iteration makes that calibration more precise.

Limitations

This project has some limitations worth naming. The user testing involved fifteen participants across two rounds. The findings from this research prove that we are on the right track. However, a larger and more diverse sample across different settings would be needed to make and support stronger claims about generalisability.

The final concept described in chapter 11, the Down to Make brand, the subscription model, the wooden box with integrated placemat, is partially untested. While the instructional system and physical making process were tested across two iterations, several components of the final concept were not validated with users. The acrylic choice cards, the placemat system, and the laser-cut wooden box exist as design proposals informed by the testing findings. A third iteration testing the full final concept in its intended materials is a good next step before claims about the complete system can be made.

There is also a question about longevity that this project could not answer. Both test sessions were single encounters. Whether the toolkit produces lasting skill development across a full curriculum of sessions in independence and physical and cognitive skills, with scaffolding progressively reduced over time, would require longitudinal testing that was outside the scope of this project and remains an open question for future research.

Finally, the challenge-skill balance model was theorised for the general population. Applying it to a group with shorter attention spans and reduced working memory is an extension of the model rather than a direct application. Consistent with how this project treats the DfDIY framework and its validity for this demographic, the challenge-skill balance model would benefit from dedicated study for this demographic.

15. CONCLUSION

This project set out to answer the following question: “How can the ‘Design for DIY framework’ be adapted to develop a toolkit that facilitates independence, skill acquisition and fosters a sense of pride for people with cognitive disabilities, focusing on (young) adults with Down syndrome, to advance the democratisation of design?”

The answer, grounded in literature review, semi-structured interviews, research through design and two rounds of user testing, is that the DfDIY framework can be meaningfully extended to this demographic. That extension is not a full replacement of the framework but modifications and additions to it.

Three elements of Hoftijzer’s original framework are retained: the shift in the designer’s role from creator to facilitator, the distinction between fixed and free design space, and pride of authorship as one of the key intended outcomes of the DIY process. These form the foundation on which the extended framework is built.

Two elements require modification rather than replacement. The definition of the layperson must be expanded. Where Hoftijzer’s framework addresses exclusion caused by habit and de-skilling, this project addresses exclusion caused by physical and cognitive barriers specific to Down syndrome. The co-creation mechanism must also be restructured. Abstract verbal decision-making, which the original framework assumes, is replaced by a tangible card-based choice system that makes creative agency accessible across the full cognitive range of the target group.

Five elements must be added that are not present in Hoftijzer’s framework at all. These are the following:

- 1. The addition of embedded instruction as a design requirement:** guidance must be physically integrated into the tools and components themselves.
- 2. The application of errorless learning to both tools and choice systems:** preventing incorrect actions before they occur to protect the user’s sense of self-efficacy.
- 3. The use of multiple means of representation within the instructional system:** this is the simultaneous delivery of the same instruction through multiple channels at once.
- 4. The use of aesthetic scaffolding:** the deliberate selection of materials and techniques that produce a

professional-quality artefact regardless of the maker’s fine motor precision, so that the object itself mediates societal perception.

- 5. The fifth is scaffolded independence at the curriculum level:** where support is systematically reduced across a sequence of kits so that independence grows over time rather than being assumed from the start.

Without these modifications and additions, the framework’s promise of democratising design implicitly excludes anyone for whom standard tools, instructions, and environments present physical or cognitive barriers. Hoftijzer’s framework was designed for a general layperson and it is a logical consequence that a specific demographic with unique physical and cognitive needs requires tailored adaptation. With these modifications, the framework can be extended to reach a demographic that falls outside its original scope and that the maker world has not yet been designed for (see figure 58 and 59).

Design for DIY framework



Figure 58: Hoftijzer’s (2024) DfDIY framework.

Design for DIY framework for Down syndrome

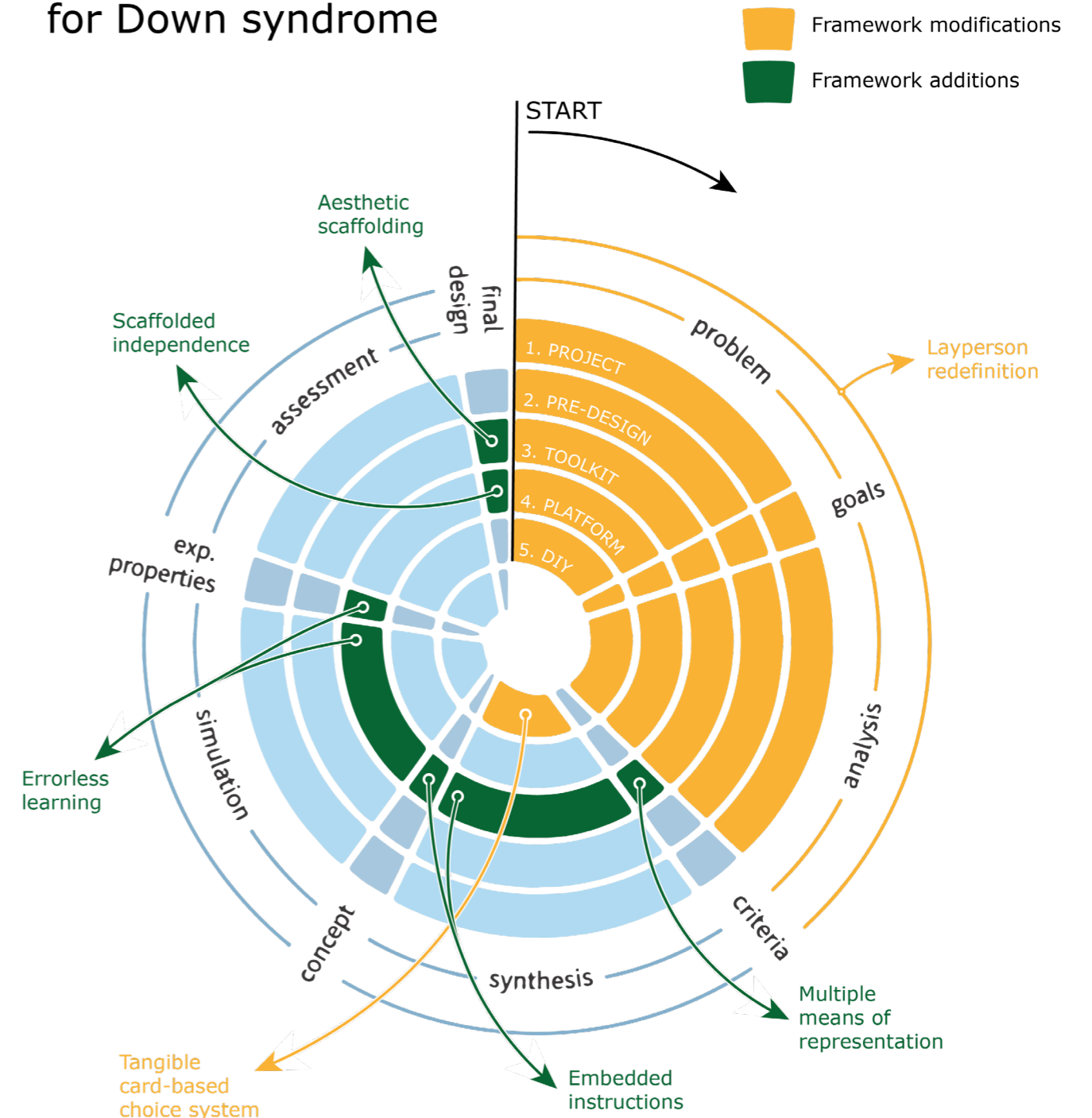


Figure 59: Visual representation of how Hoftijzer’s original framework has changed to fit people with Down syndrome.

The Down to Make screen-printing kit demonstrates this in practice. Against the four aims that shaped this project, independence, skill acquisition, pride of authorship, and democracy in design, the concept delivers as follows.

Independence

Independence is built into the structure of the kit rather than the user depending on the presence of a facilitator. Embedded instructions in the physical components, a layered instructional system combining video, physical written instructions with images, and physical cues, and an errorless learning approach that prevents mistakes before they occur all work together to reduce the need for human intervention. The testing confirmed this: facilitator interventions dropped significantly between the first and second iteration, and participants consistently achieved more independently than their teachers had expected.

This independence is also facilitated by the facilitators themselves, designers, teachers, and parents, resisting the urge to help too much too quickly. Giving participants time and room to figure things out on their own is as important as any structural feature of the kit.

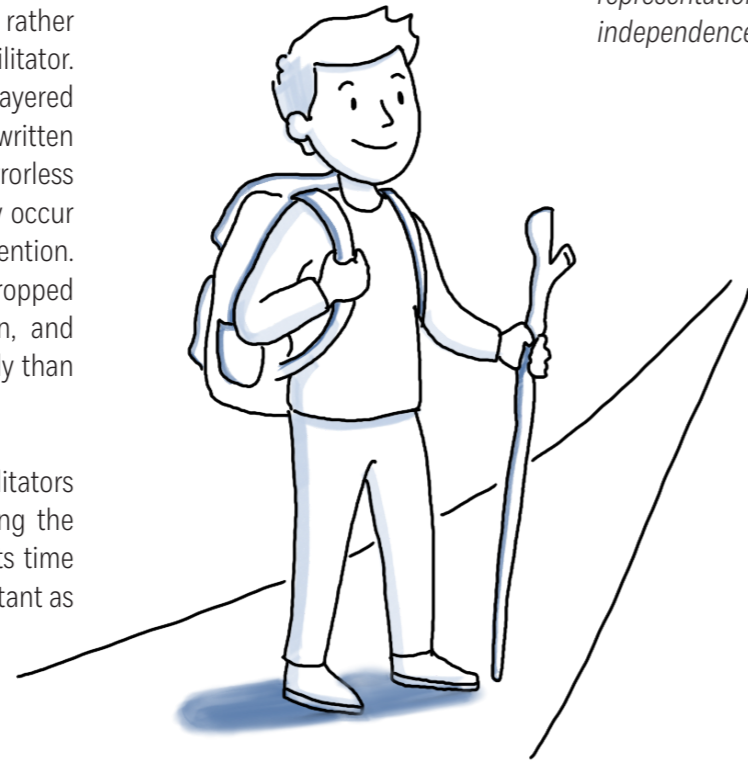


Figure 60: Visual representation of independence.

Skill acquisition

Skill acquisition is facilitated through the scaffolding framework that supports the kit's curriculum design but also by the multiple means of representation. The combination of an instruction video, a written booklet with images and embedded instructions made skill acquisition possible. The activity itself is actually complex, screen printing is a real technique with real steps, and participants learned it. They each left the session with a beginning understanding of stencil logic, negative space, frame construction, and material handling that they did not have before. The progressive reduction of support across a curriculum of kits means that skill development will continue to grow over time and is not confined to a single session. By raising challenge together with growing skill, the curriculum is designed to keep the user within Csikszentmihalyi's flow channel. Sustaining engagement and avoiding both the anxiety of overwhelming tasks and the boredom of repetitive ones.



Figure 61: Visual representation of skill acquisition.

Pride of authorship

Pride of authorship was the most consistently observable outcome across both rounds of testing. The choice cards ensured the participants had a say in what they wanted to design and create resulting in genuine pride. Every participant wanted to show their finished object to someone. Spontaneous expressions of pride, tears of joy, exclamations of disbelief, the immediate impulse to make a second print as a gift, appeared without prompting and across the full range of cognitive levels present in the testing groups. Lastly, the aesthetic scaffolding built into the kit, ensuring that the final artefact communicates professional quality regardless of the maker's fine motor precision, means that the pride participants feel is supported by an object that earns it in the eyes of others.



Figure 62: Visual representation of pride of authorship.

Democracy in design

Democracy in design is delivered through the choice card system, which gives every participant actual authorship over the outcome from the very first step. In Hoftijzer's framework, design democracy is defined by the shift from passive consumer to active maker, a shift that depends on the user having genuine agency over what they create and how it looks. The choice card system operationalises this shift for people with Down syndrome by replacing abstract verbal decision-making with tangible, physical selection, making authorship accessible across the full cognitive range of the target group.

The democratic participation is designed to function across a wide range of cognitive levels. Participants who can read and make selections independently do so. Participants who cannot are able to point to their preferred card when options are presented to them. The multiple means of representation built into the instruction system, video, photographs, written text, physical cues, and embedded instructions (for example the blue side of the frame and staple markings), mean that the activity is accessible to the full cognitive spectrum of the target group, not only to its most able members. Pre-made design options serve participants who cannot cut their own stencil without removing their creative agency entirely. This means the kit's democratic promise is available to everyone, not just its most able users.

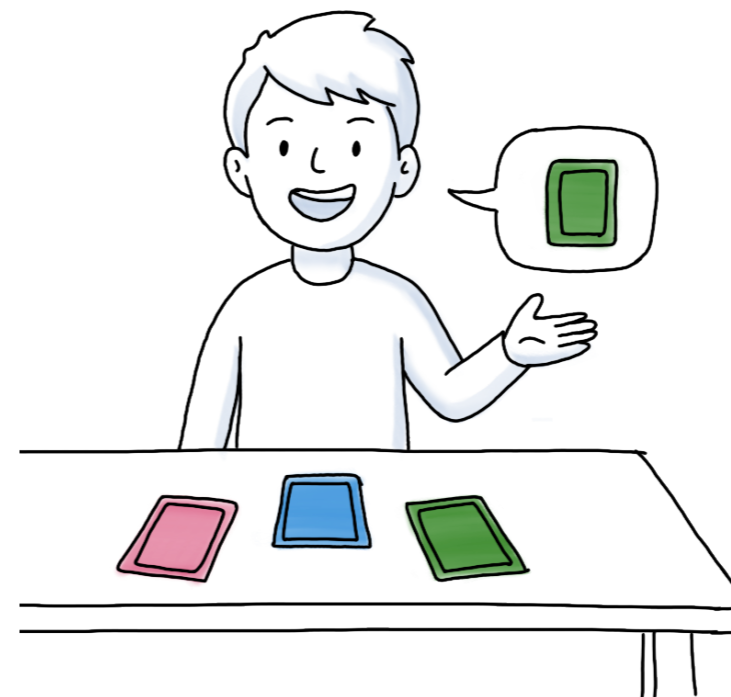


Figure 63: Visual representation of democracy in design.

The handbook for designers

Beyond the buildkit itself, this project produces a set of thirty-eight tested, actionable design guidelines for any designer who wants to develop buildkits for young adults with Down syndrome. These guidelines span across activity selection, kit design, facilitation, and evaluation, and are grounded in both the literature review and two rounds of user testing with fifteen participants. It is one of the main mechanisms through which the project extends the DfDIY framework: not only by demonstrating one working kit, but by giving future designers a starting point and the tools to build many more.

The instructional system, the making process, the choice card logic, and the physical adaptations to the frame and staple gun were all tested with users across two iterations. The complete Down to Make packaging system, the laser-cut wooden box, the integrated placemat, and the acrylic choice cards, represents a design proposal informed by those findings but not yet validated in its final materials. A further iteration testing these elements is a necessary next step before claims about the complete system can be made with full confidence.

Taken together, these findings suggest that the maker world is not inherently inaccessible to people with Down syndrome. What has made it inaccessible is that its tools, environments, and instructions assume a neurotypical user. The typical response to this mismatch is to manage the individual, to simplify, supervise, and compensate. This project suggests a different response: fix the design. When the tools, instructions, and environment are built to include rather than exclude, people with Down syndrome engage, create, and produce work they are proud of. This project began with a vision of a future where design democracy is extended to everyone, where designers empower both neurotypical and neurodiverse individuals to move from passive consumers to active makers. Down to Make is a first concrete step toward that future. This project offers one demonstration of what that can look like and a set of guidelines for designers who want to build on it.

16. RECOMMENDATIONS

Based on the findings and limitations of this project, the following recommendations are made for future research and development.

The first recommendation is to test the full final concept as described in chapter 11. The acrylic choice cards, the placemat system and the laser-cut wooden box were not tested with users due to budget and time constraints. These components are important to the final design and their usability needs to be validated before any further and final claims about the complete system can be made.

The instructional system and making process should also continue to be tested with larger and more diverse groups. Fifteen participants across two iterations is a good starting point but not enough to draw strong conclusions about how the kit performs across different contexts and cognitive levels. Testing in different schools, day-activity centres and home settings, including sessions without a teacher present, would give a much clearer picture.

The curriculum structure needs to be tested over time as well. One of the core promises of the Down to Make buildkits is that independence grows across a full curriculum of six kits, with scaffolding progressively reduced in each one. This has not yet been tested. A longitudinal study following a group of participants through a complete curriculum would be needed to find out whether the toolkit actually builds lasting skill and independence over time. I would suggest the kit needs at least one more round of iterations before a minimum viable product can be reached.

Within the screen-printing kit, one open question is whether participants could build the wooden frame entirely from scratch themselves or build a larger frame. There was not enough time available during testing to explore this but it would represent a step up in complexity and skill acquisition worth testing in a future iteration. On top of that, it would be worth testing if it helps the users to use the staple gun on a practice piece before working on the final frame. At least one more iteration would be needed for the screenprinting kit.

Beyond screen printing, other making techniques need to be developed and tested. The guidelines in this project are intended to work across a wide range of activities but this has not yet been shown in practice. Each new technique will surface new design challenges and make the guidelines stronger.

It would also be worth involving young adults with Down syndrome more directly in deciding what the next kit should be. The current toolkit was designed based on research and interviews with educators. Giving the target group a say in what comes next would be a natural extension of the democratic design principles the project is built on.

Future projects should also look at whether the methodology transfers to people with other intellectual disabilities. The guidelines developed here came from research specific to Down syndrome but many of the underlying principles are likely relevant to a broader group. Testing this would extend the reach of the work.

Finally, building the Down to Make webshop and setting up partnerships with organisations like Stichting Downsyndroom and VSO and ZML schools would be an important step toward getting the kit to the people it was designed for. These organisations are already identified in the stakeholder map as key connections to the target group and working with them is what turns this project from a graduation thesis into something that actually reaches the people it set out to serve.

17. REFLECTION

Looking back at this project, one of the best decisions I made was choosing to work with people with Down syndrome as my target group. It is a topic that is close to my heart, my aunt has Down syndrome and we are very close, and that personal connection meant my motivation never wavered throughout the project, even during the harder stretches. Choosing a subject you genuinely care about makes a difference, and I felt that throughout.

What I did not fully anticipate was how much fun the testing would be. Both groups of participants were so kind, genuine, funny and smart that I had a smile on my face for the entire duration of both sessions. Seeing how excited they were to make something of their own, watching their expressions when it worked, and being in the room when they were proud of what they had made were moments I will not forget. The week after one of the sessions I received cards from the whole group, each of them thanking me individually for the fun day they had. That meant more to me than any test result.

One moment in particular has stayed with me. A participant had printed their favourite WWE club onto their shirt and when they lifted the frame and saw it, they exclaimed "I am so proud!!" That was the moment everything I had worked so hard for felt worth it. It was exactly why I had started this project in the first place, to see this group happy, independent and making something entirely their own.

Although I came into this project already knowing the target group through my aunt, I was surprised by how much I still learned. I gained a much deeper understanding of how people with Down syndrome think and how their motor profile affects the way they interact with tools and materials. I learnt that familiarity with someone you love and research-level understanding of a demographic are two very different things.

At the start of this project I set out four personal learning ambitions: learning co-design with neurodiverse participants, learning how to measure intangible outcomes like pride and emotional value, developing tangible prototypes and deepening my understanding of the target group beyond my personal experience. Looking back, I feel I achieved all four. The choice card system gave me hands-on experience of creative collaboration with neurodiverse participants. The evaluation framework, combining Visual Analogue Scales and agency of display, taught me how to make intangible outcomes measurable. Building and iterating on a physical toolkit across two rounds of testing pushed me to prototype and research through design. And the combination of

literature research, expert interviews and direct testing gave me a level of understanding of this demographic that goes far beyond what I knew at the start.

One thing I would do differently is test some of my ideas with my aunt along the way. I deliberately chose not to because I was worried it would introduce bias into my decisions. Looking back I think that was overly cautious, her perspective could have added something valuable and personal to the research.

I would also have spent more time working alongside fellow students. I tend to work efficiently on my own and it is easy to fall into that rhythm, but I think connecting more regularly with peers could have brought in perspectives and experiences I missed by working alone. I did this maybe once a week or every two weeks and in hindsight I could have done that more often. The coach meetings, on the other hand, were something I always valued. They consistently pushed me to consider angles I had not thought of and kept me on my toes and from getting too caught up in my own thinking. I am grateful for those conversations.

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Google Gemini and Claude were used to rephrase some sentences that did not flow well in some of the paragraphs and to check grammar and spelling. Google Gemini was also used to create the images of the stakeholders in the stakeholder map and persona. Claude was used to check the entire document on spelling and grammar mistakes and to give final feedback on the final document. Otherwise, no AI tools were used in the preparation of this report.

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APPENDIX

Literature review key words and search strings

Key words for searching for literature:

Design for DIY and the target group:
"Participatory design intellectual disability"
"Participatory design down syndrome"
"Do-it-yourself" or "DIY"
"Co-design with neurodiverse users"
"Tangible interaction"
"Toolkit design guidelines"

Barriers and exclusion:

"Inclusive maker movement" / "Inclusive making"
"Critical disability studies makerspace"
"Barriers to participation in maker culture"
"Cognitive accessibility in design"

Psychology (pride and authorship):

"IKEA effect"
"Pride-of-authorship"
"Psychological ownership"
"Self-determination theory disability"
"Agency in assistive technology"
"Self-efficacy"

Pedagogy: (such as progressive scaffolding, visual aids, and gamification)

"Constructionism"
"Maker education special needs"
"Universal Design for Learning (UDL)"
"Scaffolding"
"Errorless learning" (A technique often used for Down syndrome to prevent frustration)
"Vocational training kits"
"Gamification"

Strings for extensive research:

"adults with Down syndrome" AND ("infantilization" OR "epistemic injustice" OR "social exclusion" OR "marginalization" OR "presumed incompetence" OR "lack of agency")

("intellectual disabilities" OR "Down syndrome") AND ("DIY" OR "maker movement" OR "toolkit" OR "fabrication") AND ("co-creation" OR "participatory design" OR "inclusive design") AND ("barriers" OR "challenges") AND ("DIY" OR "maker activities"

OR "tool use") AND ("intellectual disabilities" OR "Down syndrome") AND ("fine motor skills" OR "executive function" OR "cognitive load" OR "hypotonia")

("intellectual disability" OR "Down syndrome") AND ("pride" OR "self-determination" OR "creative agency" OR "joy of making") AND ("societal perception" OR "stigma" OR "competence" OR "social recognition") AND ("arts-based research" OR "creative practice")

("pedagogical features" OR "instructional design") AND ("intellectual disabilities" OR "Down syndrome") AND ("maker education" OR "DIY toolkit") AND ("cognitive load" OR "scaffolding" OR "universal design for learning") AND ("self-determination" OR "democratic design" OR "participatory design")

"Design for DIY" OR "DfDIY" OR "maker movement" "Down syndrome" OR "intellectual disability" design OR toolkit

"participatory design" OR "co-design" OR "open design" "intellectual disabilities" OR "Down syndrome" toolkit OR workshop

"DIY" OR "making" OR "crafting" barriers OR accessibility "cognitive disability" OR "Down syndrome" dexterity OR "fine motor"

"pride of authorship" OR "IKEA effect" OR "product attachment" "intellectual disability" OR "special needs" making OR creativity

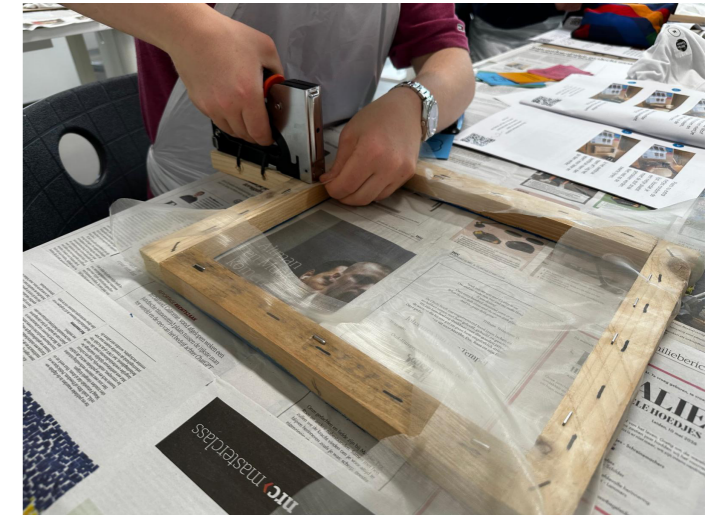
"scaffolding" OR "visual instructions" OR "gamification" design "Down syndrome" OR "intellectual disability" skill acquisition

Broad Exploration: ("Design for DIY" OR "DfDIY" OR "Maker Movement" OR "Personal Fabrication" OR "Open Design") AND ("Down Syndrome" OR "Trisomy 21" OR "Intellectual Disability" OR "Cognitive Impairment")

Focus on Method/Toolkit: ("Toolkit" OR "Instructional Design" OR "Scaffolding" OR "Visual Aids") AND ("Design" OR "Making" OR "Assembly") AND ("Down Syndrome" OR "Intellectual Disability")

Focus on Psychology/Outcome: ("Pride of Authorship" OR "Self-efficacy" OR "Product Attachment" OR "Empowerment") AND ("Making" OR "Creative Activity" OR "DIY") AND ("Disabilities")

Images of tests iteration 1 and 2







INSTRUCTIES VOOR ZEEFDrukKEN

Wat ga je maken?

Vandaag ga je leren zeefdrukken! Zeefdrukken is een manier om een afbeelding op een T-shirt, tas, poster of iets anders te maken. Je gebruikt een raam met stof, een ontwerp en verf. Door de verf over het raam te trekken, komt jouw ontwerp op de stof of op het papier.

In deze activiteit ga je je eigen ontwerp kiezen of maken en dat zelf zeefdrukken op een T-shirt, tas of poster. Aan het einde heb je iets unieks dat jij zelf hebt gemaakt.

Hoe gebruik je deze instructies?

Volg de instructies zo nauwkeurig mogelijk. Loop je vast? Probeer dan eerst het filmpje te volgen door de QR code te scannen. Lukt het nog steeds niet? Vraag dan om hulp.

Keuzes maken

1



Open de doos en pak de gekleurde keuze kaarten er bij.

2



Draai de deksel van de doos om. Lees elke kaart rustig door.

3



Kies 1 blauwe, 1 groene en 1 roze kaart.

4



Plaats je gekozen kaarten op de juiste plek.

Controleer hiernaast of je alle spullen hebt. Heb je alles? Ga dan verder!

Tip! Kruis elk voorwerp af als je het hebt.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



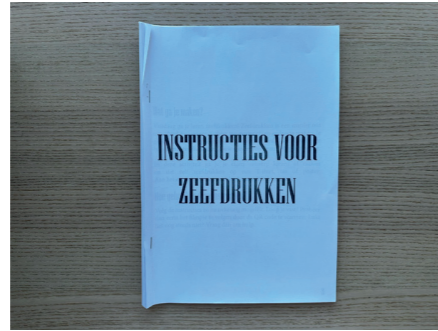
Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Wat heb je nodig?



Keuze kaarten



Instructies



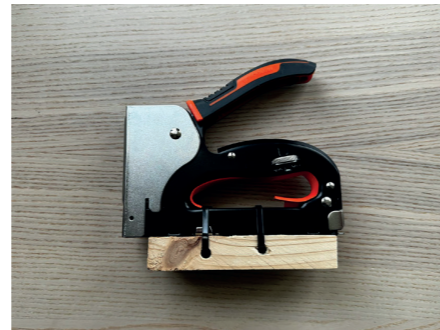
T-shirt/Tas/Poster papier



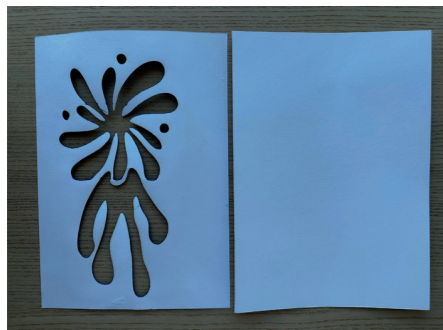
Houten lijst



Glimmende stof



Niet pistool



(Voorgemaakt) ontwerp papier



Potlood



Lineaal



Schilders tape



Precisie mesje



Lepel



Stukje karton



Textiel verf



Trekker

5

Zeefdrukraam maken

5



Pak je houten lijst, je glimmende stof en je niet pistool.

6



Leg de glimmende stof plat en zonder kreukels op tafel.

7



Leg de houten lijst met de blauwe kant naar beneden boven op de glimmende stof.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



8



Vouw de rechter lange zijde van de stof om de lijst heen.

Let op! Het nietpistool is gevaarlijk, vraag of iemand de eerste keer meekijkt.

9



Niet de stof vast aan de lijst met een nietje in het midden en in de twee hoeken. Niet vast op de zwarte lijnen.

Let op! Laat minimaal 5 cm stof over aan de linker kant.

10



Vouw nu de stof om de linker lange zijde van de lijst heen.

11



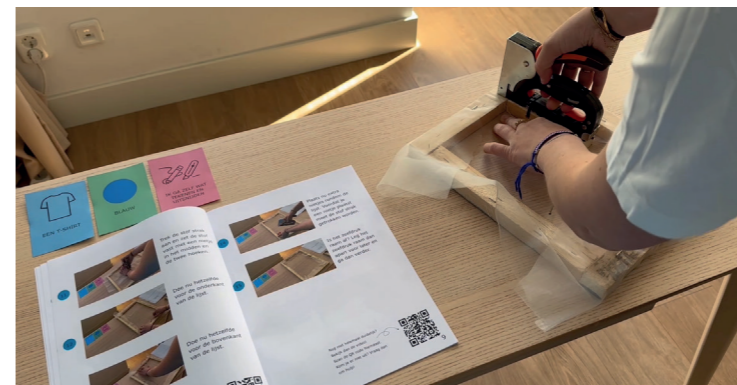
Trek de stof strak aan en zet de stof vast met een nietje in het midden en de twee hoeken. Niet vast op de zwarte lijnen.

12



Doe nu hetzelfde voor de onderkant van de lijst.

13



Doe nu hetzelfde voor de bovenkant van de lijst.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!

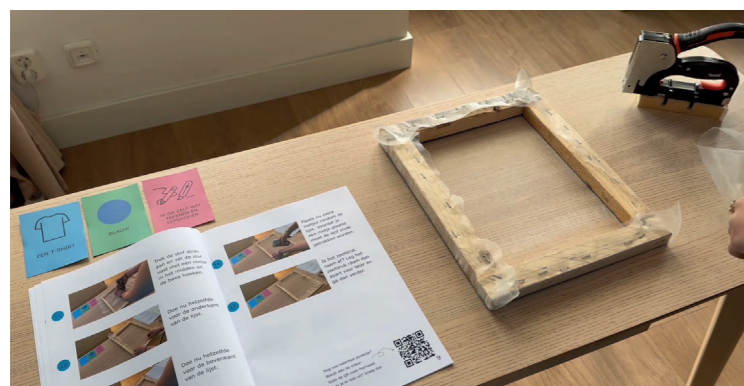


14



Plaats nu extra nietjes rondom de lijst. Voordat je een nietje plaatst moet de stof strak getrokken worden. Niet vast op de zwarte lijnen.

15



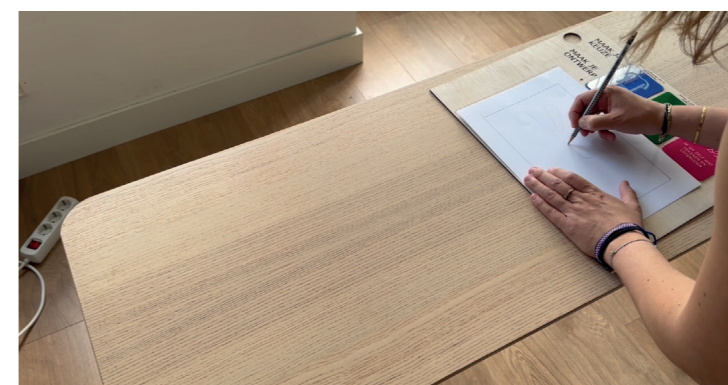
Is het zeefdruk raam af? Leg het zeefdruk raam dan apart voor later en ga dan verder.

16



Pak je stukje papier en potlood.

17



Teken je ontwerp binnen het kader. Teken simpele vormen. Er mogen geen tekeningen in tekeningen zitten.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Ontwerp maken

Nu wordt het ontwerp gemaakt. Gebruik je een voorgemaakt ontwerp? Ga dan naar stap 20. Ga je zelf tekenen en snijden? Volg dan deze stappen verder.

Zeefdruk raam klaar maken

18



Snijd nu je ontwerp uit op de placemat. Snijd door het mes naar je toe te bewegen. Pas op! Het mes is scherp.

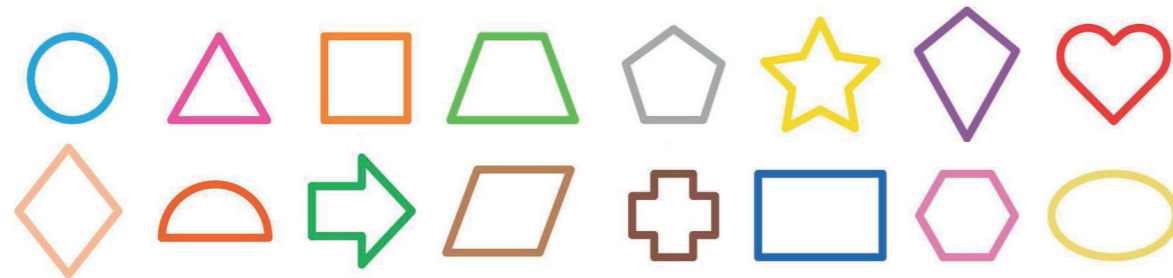
19



Ontwerp af? Ga dan verder.

LET OP! Alles wat je uitsnijdt wordt gekleurd op je t-shirt, tas of poster. Vraag om hulp als je dat nodig hebt.

Voorbeelden van simpele vormen:



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



20



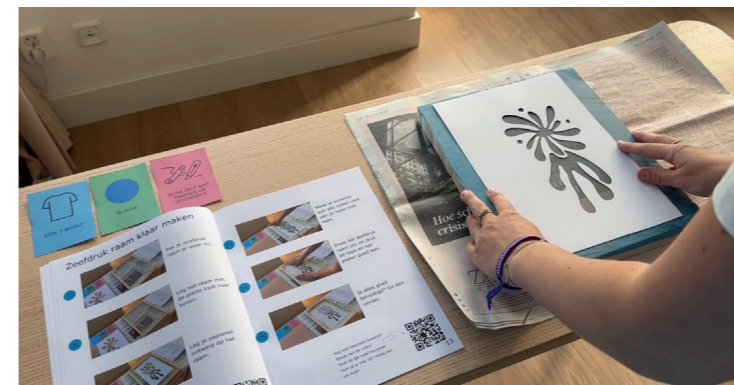
Pak je zeefdruk raam er weer bij.

21



Leg het raam met de blauwe kant naar boven.

22



Leg je papieren ontwerp op het raam.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Zeefdrukken voorbereiden

23



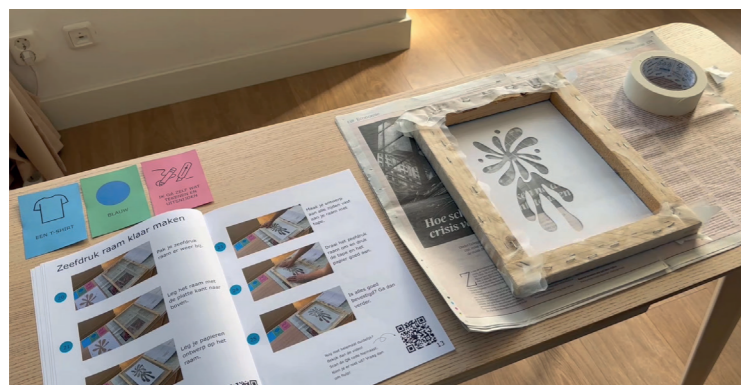
Maak je ontwerp aan alle zijden vast aan je raam met tape.

24



Draai het zeefdruk raam om en druk de tape en het papier goed aan.

25



Is alles goed bevestigd? Ga dan verder.

26



Pak je t-shirt, poster papier of tas er bij.

27



Doe een stuk dik papier in je t-shirt, in je tas of onder je poster papier.

28



Leg de kant die je wil bedrukken naar boven.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Zeefdrukken

29



Maak het t-shirt, de tas of de poster kreukel vrij door het glad te strijken met je handen.

30



Leg je zeefdruk raam boven op je t-shirt, tas of poster. Met de blauwe kant van het raam naar beneden.

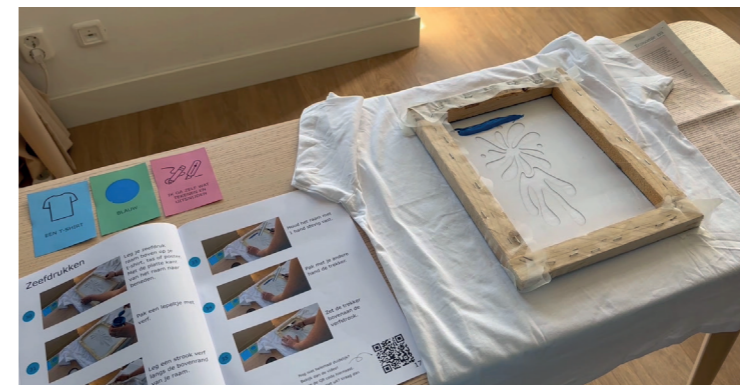
Ligt alles goed? Ga dan verder.

31



Pak een lepeltje met verf.

32



Leg een strook verf langs de bovenrand van je raam.

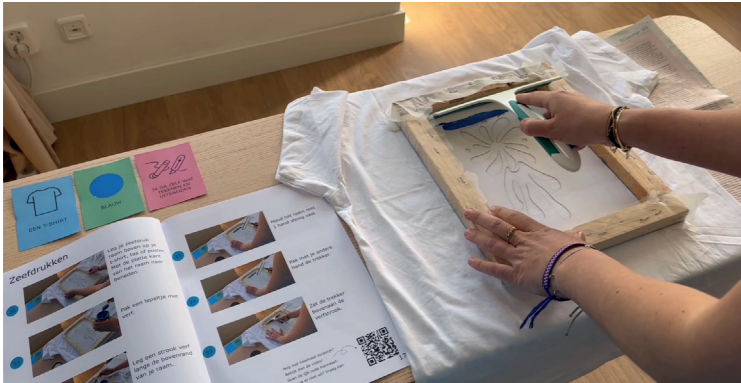
Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



33



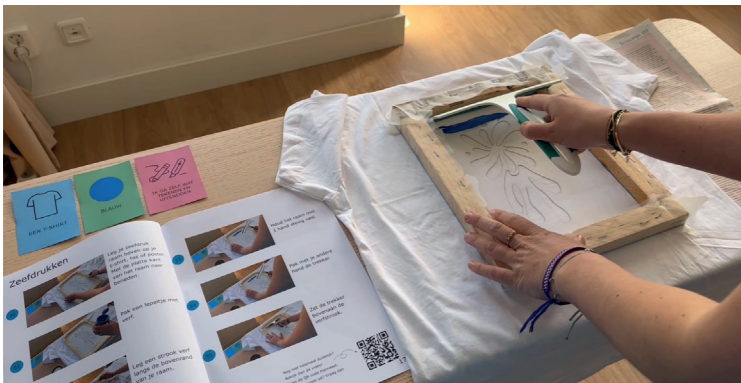
Houd het raam met 1 hand stevig vast.

36



Trek de verf van boven naar beneden over het ontwerp met lichte druk.

34



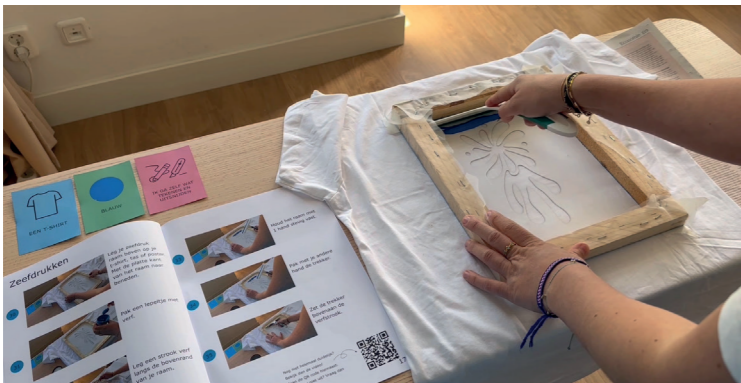
Pak met je andere hand de trekker.

37



Is alles bedekt? Zo niet, trek dan nog een keer de verf over je ontwerp.

35



Zet de trekker bovenaan de verfstrook.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Na het zeefdrukken

38



Leg de trekker weg.

41



Laat je T-shirt, tas of poster minimaal 3 uur drogen.

39



Houd je T-shirt, tas of poster met één hand vast.

42



Haal het karton eruit als alles droog is.

40



Til met je andere hand het raam omhoog en leg het raam apart.

43



Gelukt? Wat vind je van je ontwerp?

Ruim alles op. Was het zeefdrukraam en de trekker af en gooi het houten lepeltje weg.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Fixeren

44



Keer je T-shirt of tas binnenstebuiten.

45



Leg een oude handdoek tussen de stof.

46



Strijk je ontwerp voor 2 tot 3 minuten. Zo hecht de verf beter aan de stof.

Tip! Was je T-shirt of tas altijd binnenstebuiten. Zo blijft het langer mooi.

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



47



Draag met trots!

Nog niet helemaal duidelijk?
Bekijk dan de video!
Scan de QR code hiernaast.
Kom je er niet uit? Vraag dan om hulp!



Choice Cards

ZEEFDRIKKEN
BOUWPAKKET

HOE WERKEN
DEZE KAARTEN?

Met deze kaarten ga je 3 keuzes maken. Je kiest welk voorwerp je wil bedrukken, in welke kleur je wil bedrukken en hoe je ontwerp er uit komt te zien. Je mag hierbij kiezen of je een voorgemaakt ontwerp gebruikt of zelf een ontwerp maakt.

Kies 1 kaart van elke kleur. Dus 1 blauwe, groene en roze kaart. Leg de gekozen kaarten apart en pak vervolgens je benodigdheden.

WELK VOORWERP
WIL IK
BEDRUKKEN?



EEN T-SHIRT

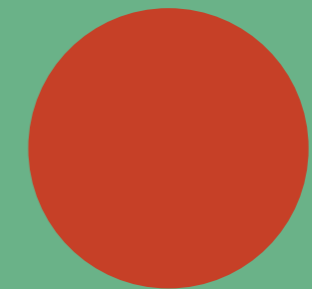


EEN TAS



EEN POSTER

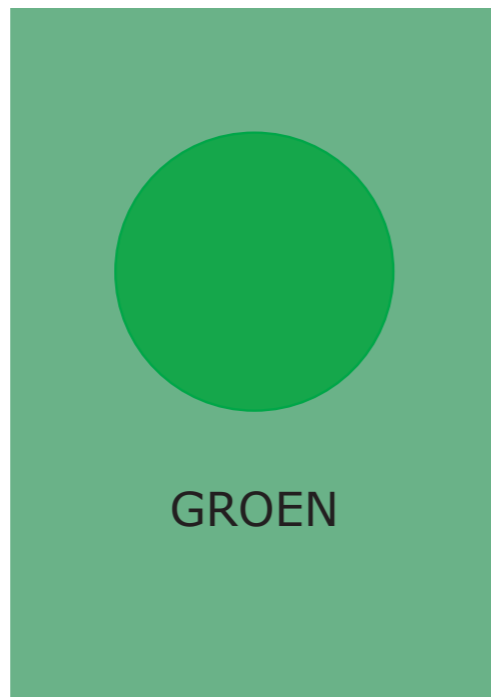
WELKE KLEUR WIL
IK GEBRUIKEN?



ROOD



GEEL



GROEN



BLAUW



ZWART



IK GA ZELF WAT
TEKENEN EN
UITSNIJDEN



IK GA ZELF WAT
TEKENEN MAAR
IEMAND ANDERS
MOET HELPEN BIJ
HET UITSNIJDEN



IK GEBRUIK EEN
VOORGEMAAKT
ONTWERP

Project Proposal form IDE Master Graduation Project

In this proposal the agreements made between student and supervisory team about the student's IDE Master Graduation Project are set out. This document needs to be prepared for the Kick-off meeting and should be submitted in MyCase.

Name student Student number

Project title

Please state the title of your graduation project (above). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

MSc programme Design for Interaction Integrated Product Design Strategic Product Design

Other (in case of a double degree outside IDE):

Introduction

Describe the context of your project in the box below; What is the domain in which your project takes place? Who are the main stakeholders and what interests are at stake? Describe the opportunities (and limitations) in this domain to better serve the stakeholder interests. (max 250 words)

The project is situated within the domains of Design for Do-It-Yourself (DfDIY) and Inclusive Design. Industrialisation has created a "bifurcation" between production and consumption, leading to passive consumerism and a disconnect from the material origins of products. The DfDIY framework, as described by Hoftijzer (2024), aims to counter this by transforming users from passive consumers into active makers, fostering sustainability and "pride of authorship".

The lack of involvement of laypersons in the conceptions of services and products especially applies to people with intellectual disabilities. This project will focus on this specific 'gap'. The main stakeholders are individuals with Down Syndrome, who are currently marginalised in the maker movement, and their caregivers or support networks. Their interest lies in moving from the role of passive recipients of care to active creators who can acquire complex skills and experience self-sufficiency.

A limitation in current DfDIY discourse is the implicit assumption of a "layperson" having sufficient neurotypical cognitive and physical abilities, which creates barriers for those with intellectual disabilities. However, research indicates that this specific demographical group (those with an intellectual disability) have strong visual learning abilities and most have sufficient social skills, providing a gap to democratise design in the context of the DfDIY framework. Furthermore, there is an opportunity to use 'pedagogical scaffolding' to support the process, using embedded instruction to manage cognitive load and facilitate skill acquisition. There is also the opportunity to use 'aesthetic scaffolding'. This addresses the outcome by ensuring artefacts look professional rather than medical, shifting societal perception of the maker from the 'medical model' (pity) to the 'affirmation model' (respect). By adapting DfDIY to be inclusive, the gap between user and products for this group can be bridged.

→ space available for images / figures on next page

Introduction (continued): space for images

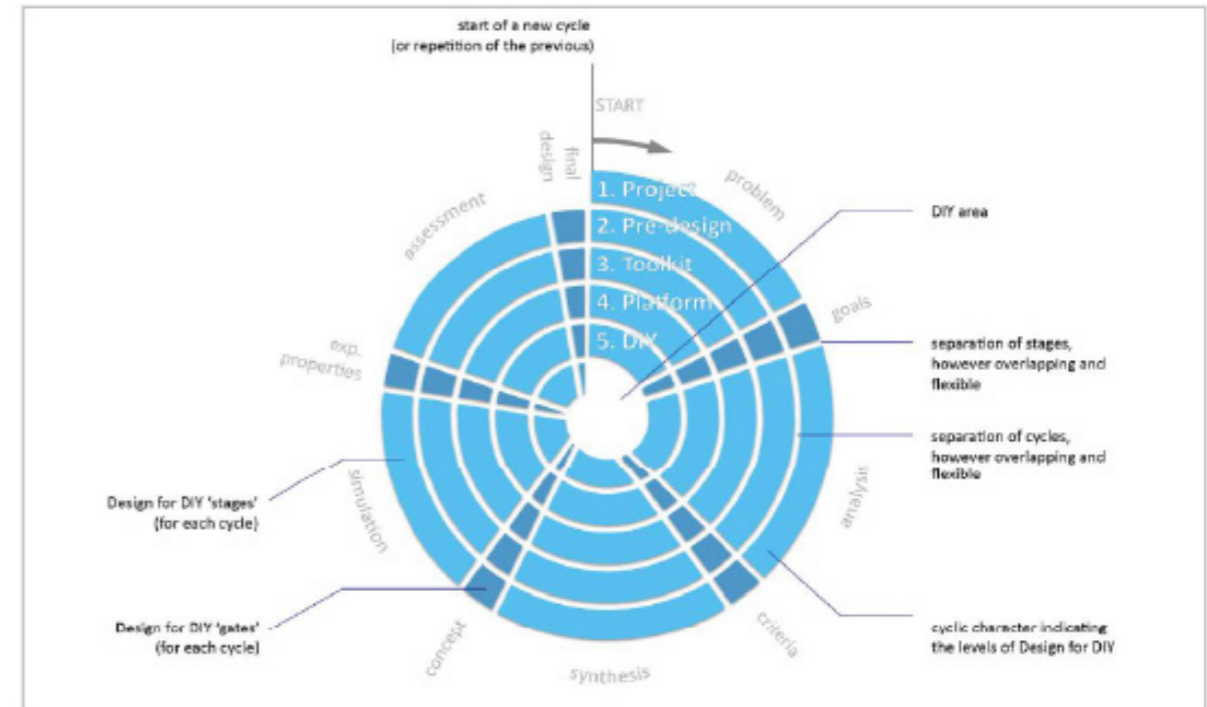


Figure 1: Design for DIY framework as described by Hoftijzer (2024).

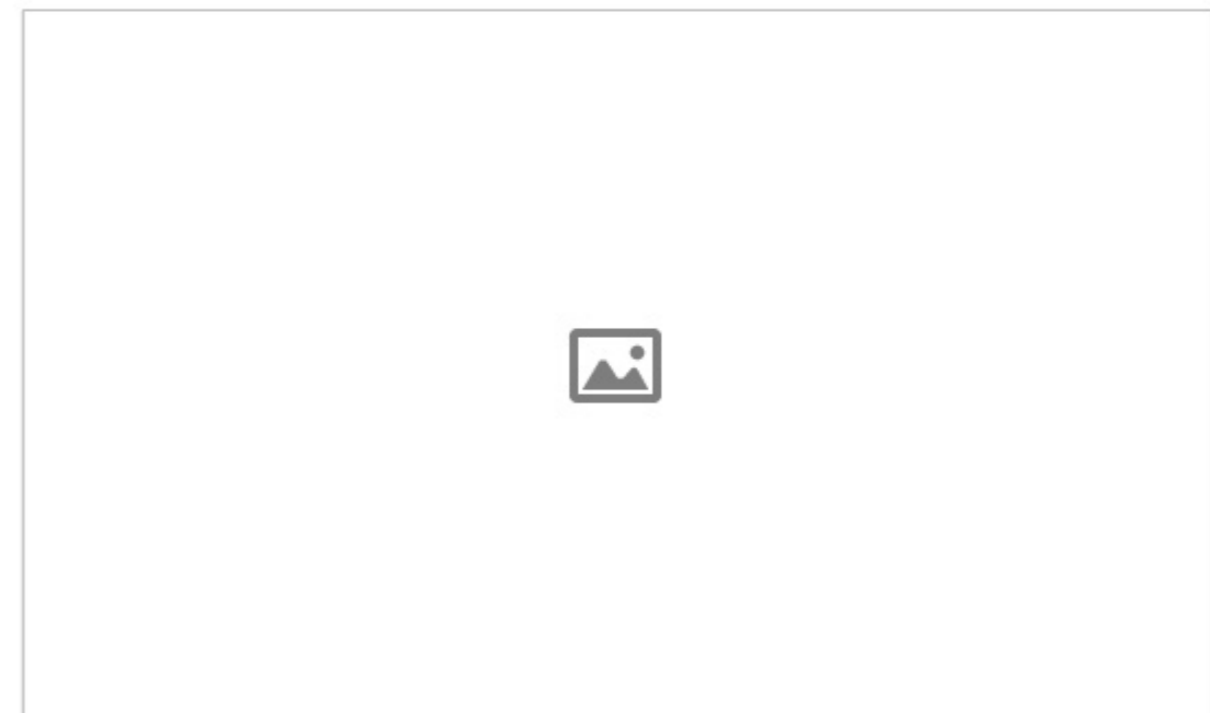


Figure 2:

Problem Definition

What problem do you want to solve in the context described in the introduction, and within the available time frame of 100 working days? (= Master Graduation Project of 30 EC). What opportunities do you see to create added value for the described stakeholders? Substantiate your choice. (max 200 words)

The core challenge is that the current practice and phenomenon of Design for Do-It-Yourself (DfDIY) relies on implied neurotypical capabilities regarding cognition (specifically executive function and working memory) and dexterity. To fully democratise design, the framework must be extended to include individuals with Down syndrome, who are currently unable to access the psychological benefits of making, such as "pride of authorship" and independence, due to a lack of tailored support.

I have chosen to address this because traditional care models often reduce these individuals to passive roles, underestimating their potential to master skills. Current tools create high extraneous cognitive load. By specifically supporting the involvement, empowerment and facilitation of people with Down syndrome through pedagogical features like physical cues (embedded instruction), I can create added value. This approach goes beyond removing barriers, it actively adapts the toolkit to recognise unique learning styles (e.g., visual learning), thereby extending the democratisation of DfDIY to a wider range of makers.

Assignment

This is the most important part of the project brief because it will give a clear direction of what you are heading for. Formulate an assignment to yourself regarding what you expect to deliver as result at the end of your project (1 sentence. As you graduate as an industrial design engineer, your assignment will start with a verb (Investigate/Design/Validate/Create), and you may use the format:

(Investigate/Design/Validate/Create) a (what will be the deliverable → prototype/roadmap/process/intervention /approach/guideline/strategy/...) to (what should it do →(create/understand/evaluate/validate/improve/execute/ analyse/...)) (the objective → experience/value/process/product/...) for (whom → target group/client/...) in (what context).

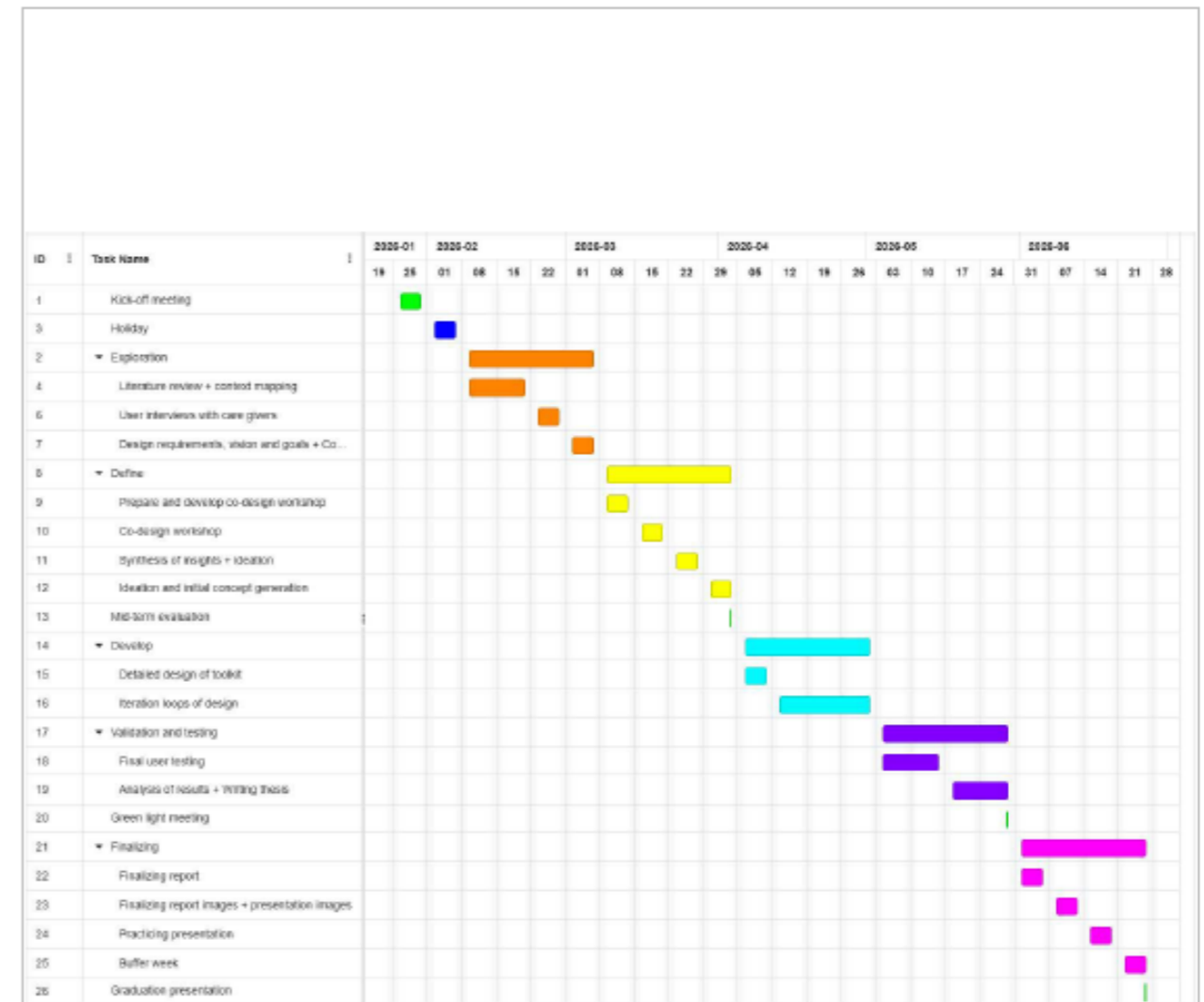
Create an inclusive Design for DIY toolkit to facilitate skill acquisition and foster pride of authorship for people with Down syndrome in the context of the maker movement and democratising design.

Explain your project approach to carrying out your graduation project and what research and design methods you plan to use to generate your design solution (max 150 words).

My approach will combine the fields of inclusive design, participatory design, the field of DIY and special education pedagogy. I will begin with a literature study as well as interviews with the demographic, their caregivers and experts active in the field of design for people with a disability. I will then analyse the specific cognitive and physical barriers inherent in current DIY practices that exclude the described demographic. Following this, I will identify and synthesise pedagogical features, such as progressive scaffolding, embedded learning, visual aids and gamification, that support learning in this demographic. Through a co-design or participatory process, I will develop a tangible toolkit that tailors the DfDIY framework to the strengths of visual learners. Finally, I will validate the toolkit by testing if it successfully enables users to acquire new skills and experience the emotional value of making and if it truly democratises design. The final result will be an inclusive DfDIY toolkit.

Project planning

To make visible how you plan to spend your time, you must make a planning for the full project. You are advised to use a Gantt chart format to show the different phases of your project, deliverables you have in mind, meetings and in-between deadlines. Keep in mind that all activities should fit within the given run time of 100 working days. Your planning should include the Kick-off, Midterm Evaluation, Green Light and Finalisation (ceremony). Please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any (for instance because of holidays or parallel course activities). Add (an image of) the planning in the box below. If it is not readable, you can add the planning as an attachment to My Case along with this Proposal.



Motivation and personal ambitions

Explain why you wish to start this project, what competencies you want to prove or develop (e.g. competencies acquired in your MSc programme, electives, extra-curricular activities or other).

Optionally, describe whether you have some (max 5) personal learning ambitions which you explicitly want to address in this project, on top of the learning objectives of the Graduation Project itself. You might think of e.g. acquiring in depth knowledge on a specific subject, broadening your competencies or experimenting with a specific tool or methodology (200 words max).

This topic speaks to me as I am a maker at heart who loves the hands-on process of bringing ideas to life through prototyping. However, I want to use this "maker spirit" for meaningful inclusion. I believe everyone deserves to experience the fulfilment of creation so I chose to focus on people with a cognitive disability, specifically people with Down syndrome because of my close relationship with my aunt. I see firsthand how capable she and others are, yet society often treats them as "passive receivers of care" rather than active participants. It is remarkable how often the current system underestimates people like her. This project combines my passion for Human-Centred Design with a personal mission. By developing a DfDIY toolkit, I aim to prove that with the right support, people with cognitive disabilities can be creators. Democratizing design to give them the confidence to make things themselves, and seeing that "pride of authorship" emerge, is exactly what I find fulfilling.

Personal Learning Ambitions:

- Co-Design: I want to master co-design by adapting it for neurodiverse participants, not by performing standard interviews but true hands-on, creative collaboration. A skill I have not often used in my studies.
- Validating value: I aim to learn how to measure intangible outcomes, specifically determining when a user's emotional needs are met and the design provides true value for this demographic.
- Tangible prototyping: I want to challenge my design skills by creating physical toolkits that are simultaneously intuitive and educational.
- User Understanding: I want to deepen my understanding of the target group beyond my personal experience to ensure I can create a solution of genuine value to them.

Transcribed Semi-Structured interviews

Interview A

Spreker 1: ...van de [Onderwijsproject A]. En ik ben dat gestart, nou ja, nu ongeveer vijfenhalf jaar geleden. We zijn dat gestart, eerst was ik persoonlijk begeleider van [cliënt], een van onze cliënten en ook de zoon van [ouder]. En eerst was ik persoonlijk begeleider en toen hadden we eigenlijk het plan: hé, ik heb een Paboachtergrond, dus we hadden gezegd van: hé, misschien is er nog meer in begeleiding mogelijk en misschien kunnen we wel een klein schooltje starten. En dat zijn we gestart, dus vijfenhalf jaar geleden, en we zijn nu uitgebreid naar 18 leerlingen. Dus het is gestart als een ouderinitiatief en met twee leerlingen, twee docenten. En nu geven we drie dagen in de week les, twee dagen geven we begeleide stage. En van onze 18 leerlingen zijn er 18 met het syndroom van Down.

Spreker 2: Oké, ze hebben allemaal syndroom van Down?

Spreker 1: Ja, dus we zijn niet speciaal gestart met een 'Downschool'. We zijn eigenlijk gestart met: hé, wie wil een leven lang leren? En ja, vanuit het netwerk, ja, heel veel mensen met het syndroom van Down kennen elkaar of komen elkaar tegen bij de hockey of bij de tennis of bij het zwemmen. En eigenlijk zijn we zo uitgebreid en hebben we nu een schooltje met 18 syndroom van Down kinderen.

Spreker 2: Oké, wat cool! Superleuk concept en vet dat jullie dat hebben opgericht toen.

Spreker 1: Zeker!

Spreker 2: Ja, zeker. Ja. En trouwens even tussendoor: vind je het oké als ik ons gesprek opneem? Puur, dan zal ik het later zelf even terug gaan luisteren.

Spreker 1: Nee, is prima.

Spreker 2: Super, dank je. Ja, want wat ik eigenlijk wil doen met mijn afstudeerproject... ik had het misschien een beetje te ingewikkeld opgeschreven in de mail, ik weet niet of je het begreep of niet, maar ik zal het nog even uitleggen. Eigenlijk kort door de bocht wil ik graag iets maken waar ik ook mensen met Down eigenlijk ondersteun om door te kunnen blijven ontwikkelen en dat ze nieuwe vaardigheden kunnen aanleren. En dat is... daar ben ik op gekomen door een van mijn professoren aan de TU Delft, die ooit een onderzoek heeft gedaan naar hoe design kan democratiseren. En dat had hij gezegd van: nou, dat wil ik dus voor iedereen toegankelijk maken. Maar eigenlijk toen ik zijn onderzoek ging lezen, was het niet per se voor iedereen toegankelijk. Dus ben ik gaan kijken naar mensen met een beperking. Dat kon van alles zijn toen. En toen ging ik nadenken van: oké, maar dat is eigenlijk wel heel breed voor de tijd die ik heb. Dus ben ik gekomen op mensen met syndroom van Down, ook omdat mijn tante syndroom van Down heeft, dus dat ligt dan toch nog wel dicht bij huis zeg maar.

Spreker 1: Dat is een mooie link.

Spreker 2: Ja, dus dat vind ik ook gewoon heel interessant om te onderzoeken. En ja, dus eigenlijk wil ik iets van een toolkit gaan maken waarbij ik ze dus een nieuwe, ja, skill aan kan leren. Dat mag zijn van, weet ik veel, stoelen maken tot een T-shirt ontwerpen en dat maken met een zeefdruk bijvoorbeeld, of iets leren in elektronica. Nou, dat soort dingen. En mijn vraag is een beetje eigenlijk aan jou, mijn grootste vraag is: wat is wat mensen met syndroom van Down misschien niet leren, wat kinderen met een, ja, neurotypisch brein misschien wel leren op school bijvoorbeeld? Of hebben zij...

Spreker 1: Ja, sorry... Ik ben benieuwd, moet het een motorische vaardigheid zijn?

Spreker 2: Eh, ja, voor mijn onderzoek denk ik het liefste wel, omdat ik graag een fysieke toolkit wil maken. Maar als jij nog ideeën hebt voor een cognitieve vaardigheid, dan sta ik daar ook zeker voor open.

Spreker 1: Ja. Ja, ik heb al... ja, ik had al gedacht: oh, dit... zoiets gaat vast passen. Bijvoorbeeld ontzettend interessant... we hebben ook met onze klas hebben wij een groepsapp.

Spreker 2: Hm-hm.

Spreker 1: En in die groepsapp, daar gaat het nogal eens mis. Als we kijken naar communicatieve vaardigheden hè, die zijn gewoon wat minder ontwikkeld. Ze zijn daarmee ook wat minder tactisch. Ze kunnen wat minder ver nadenken van: hé, wat zijn oorzaak-gevolgen? Het is hier en nu denken: hé, ik ben nu boos op jou, dus nu een scheldwoord of lelijk woord hier op de app. Maar wat dat dan verder gebeurt met de relatie en hoe dat verder dan gaat onderling, ja, dat overzien ze zeg maar niet. Ja, en ik heb er wel eens over nagedacht... ik begeleid hun dan, want ik vind wel dat het echt in een veilige situatie dat ze dat moeten oefenen. Dus ik heb mezelf gebombardeerd als app-politie. Dus ik heb verschillende regels uitgelegd en ik heb... maar op het moment, bijvoorbeeld: tot acht uur mag je appjes sturen naar elkaar, daarna doen we het niet meer. Als je iets schrijft moet het iets vrolijks of iets aardigs of iets liefs zijn. Nou, stuk voor stuk regels. Maar toch merk ik steeds: de gebeurtenissen die gebeuren op de app, die komen ook onze klas binnen. En ik heb wel eens nagedacht: eigenlijk moet ik er tussen zitten, dus op het moment dat iemand iets schrijft, dat ik het even kan controleren van: hé, voldoet dit aan mijn regel zeg maar, en dat ik het dan doorstuur. Maar ik... dus ik heb daar even over zitten worstelen.

Spreker 2: Ja, dus dat die communicatie eigenlijk qua vaardigheid dan zeg maar verbeterd kan worden.

Spreker 1: Ja.

Spreker 2: Oké, wel interessante.

Spreker 1: Ja, want dat komt echt je klas binnen hè. Op het moment dat in het weekend zoiets gebeurt, op maandagochtend wordt dat weer... nou, ik wou zeggen uitgevochten, dat is een lelijk woord, maar dan wordt dat weer... ja, komt het in de klas weer terug.

Spreker 2: Ja, snap ik. Ja. Want wat ik in mijn onderzoek tot

nu toe al gevonden had, inderdaad ja, dat mensen met Down wat moeite hebben met het communiceren en die sociale vaardigheden misschien wel iets meer. En daar waren al een aantal dingetjes op bedacht om in ieder geval het communiceren met ze makkelijker te maken. En dat ging dan via kaarten, en daar stond dan een afbeelding op en een zin, om te kunnen praten over moeilijke onderwerpen. Dus zoiets dacht ik ook aan om terug te laten komen in mijn toolkit die ik wil gaan maken om in ieder geval soort van die communicatie dan goed te krijgen zeg maar, dat het niet allemaal te lastig wordt. Maar of dat dan echt op die sociale vaardigheden gaat en over die grenzen enzo, dat is denk ik dan misschien net een beetje buiten de scope van mijn onderzoek. Ja, ook echt omdat het omdat het toch wel een designstudie is die ik ook doe. Maar ik vind het wel... ik vind het wel interessant. Ik ga hier wel nog even over nadenken, want ik vind het wel een goede. Ja, want als je kijkt naar de motorische vaardigheden, wat is iets wat... ik weet niet, hebben jullie op school zeg maar, hebben jullie dan ook... wat voor vakken, denk ik dat jullie dat noemen, geven jullie? Of geven jullie ook creatieve vakken? Hoe zit dat een beetje in elkaar?

Spreker 1: Ja, we geven nu... ja, ik geef altijd op woensdag les. Vandaag hebben we het gehad over... we zitten bij de houtafdeling. We hebben een vogelhuisje gemaakt, een voederbak zijn we nu aan het maken, waarbij we wel gaan schuren, boren, frezen van gaten frezen in een plank, timmeren. Dus dat doen we op dit moment. Maar soms het is ook zelfredzaamheid, dus bijvoorbeeld de was doen, de was drogen, de was ophangen, de ramen zemen, bed opmaken, bed ontdekken, bed afhalen. We gaan soms naar de sport, dus dan krijgen we sportlessen over de grove motoriek, de fijne motoriek, klimmen, klauteren. Dingen... we gaan het hebben over koken, dus daar motorische vaardigheden van hé, snijden en dingen bakken en dingen maken, dus dat doen we. Ja, en zo zijn er allerlei dingen. We zijn bij bloem en dier geweest, waar we de verzorging zijn gaan oefenen met kleine dieren en waar we leren bloemschikken. Dus ja, daar zit de range zeg maar.

Spreker 2: Ja, echt wel heel divers ook, wel leuk lijkt me.

Spreker 1: Ja.

Spreker 2: Want heb jij ooit gehoord van een van de leerlingen dat zij heel graag iets willen maken, maar waar ze het niet per se konden maken omdat de faciliteiten er niet voor waren of omdat er wordt gezegd van: nou, ik denk dat dat misschien te ingewikkeld is? Is er ooit zo'n wens uitgesproken? Of zeg je van: nou, eigenlijk niet?

Spreker 1: Nou ja, we hebben het steeds met onze leerlingen over wensen hè, van hé, wat wil je in de toekomst halen, waarom moeten we dit leren? Orale behoeftes, eten, drinken, dat is bij syndroom van Down kinderen natuurlijk echt... dat staat eigenlijk op één. Niet maat kunnen houden van hé, wat wil ik allemaal eten. Maar koken is bijvoorbeeld ook wel iets van wat met zelfredzaam te maken heeft, stappenplannen

van hé, hoe maak ik een eenvoudige maaltijd? Ja, dat vind ik ook wel bijzonder of dat vind ik wel interessant. En dan gaat het niet per se over de motorische vaardigheden, maar ook het stukje planning en stukje organisatie. Nou ja, wat is een gezonde maaltijd, waar moet ik op letten? Ja, zo die dingen.

Spreker 2: Oké.

Spreker 1: Dus dat was wel een wens van verschillende leerlingen bij ons, dat ze zeggen van: nou hé, ik vind het later echt interessant om bij een restaurant te werken bijvoorbeeld.

Spreker 2: Ja. Want hoe oud zijn de leerlingen eigenlijk die op school zitten?

Spreker 1: We hebben van 17 tot 25.

Spreker 2: Oké, dat is wel gewoon een grote range zeg maar. En zitten die dan allemaal in één klas dan denk ik? Of...

Spreker 1: Ja, het ligt eraan, want we kijken ook wel... we differentiëren natuurlijk hè. Dus het hoeft niet te zijn dat die van 25 het meest ver is in zijn ontwikkeling. We kijken gewoon naar wat kan iemand aan en wat is een goede mix ook in de klas.

Spreker 2: Ja, ja. En je had het ook net over het houtbewerken. In hoeverre laten jullie ze daar zelfstandig in werken? Of is er echt veel begeleiding die daar bij wordt gegeven? En hoe gaat dat proces een beetje?

Spreker 1: Ja, nou dat gebeurt ook op de woensdag, het stukje hout. En wij zitten in een school, op een MBO-school. We zitten een MBO-school van Zorg en Welzijn. En wij gaan dus mee met een klas Zorg en Welzijn en die krijgen dus ondertussen les: hoe begeleid je leerlingen met het syndroom van Down. Dus het mes snijdt aan twee kanten: wij krijgen extra les op het MBO en de leerlingen van het MBO krijgen les in werken met cliënten. Ja, en met dit project hebben we ook een inclusie-prijs gewonnen. Ja, en hoe... het is meestal dan één-op-één, één-op-twee. Dus één begeleider, twee cliënten. Dus zo luxe hebben we het wel. En wat laten we doen? We vragen dus wel echt aan de studenten: hé, ga op je handen zitten, doe zo min mogelijk, maar laat onze leerlingen zoveel mogelijk zelf doen. Dus de studenten die boren niks, maar onze leerlingen die boren alles. En bij de één komt er een scheef vogelhuisje uit, maar daar gaat het dus niet om, het gaat om het proces naartoe.

Spreker 2: Ja. En hoe worden die instructies voor het maken van het vogelhuisje dan gegeven? Is dat een papiertje met instructies erop? Of zien ze een filmpje of...

Spreker 1: Ja, alle dingen worden eigenlijk gedaan hè. Dus ze krijgen een bouwpakket, dus echt een papier van hé, zo moet het eruit komen te zien. Ze krijgen een voorbeeld. Dus dat modeling hè, van voordoen-nadoen gebeurt heel veel. Maar het zijn ook verbale instructies van hé, pak onderdeel A, zet het op B, en nou zo, dus het wordt van alle kanten wel aangeboden. Maar de een is gewoon wat meer visueel of auditief ingesteld als de ander. Maar er zit heel veel modeling hè, van voordoen-nadoen.

Spreker 2: Oké. En is dit ook iets waarvan een leerling zegt

van: nou, dit wil ik echt veel meer doen, misschien ook in mijn vrije tijd, gewoon dat creatief bezig zijn en misschien ook het maken? Of is het juist meer van: ik wil echt meer een totale andere vaardigheid leren? Of is het echt van alles?

Spreker 1: Nee, het is echt verdeeld. Het is net een gewone voortgezet onderwijsklas. De een wil graag in het hout, de ander vond het dieren en groen ontzettend interessant, de ander wil weer echt in de horeca... ja, er is bij ons eigenlijk ook geen... nee, is echt gewoon inderdaad net zoals in een normale klas zeg maar. Ja, daarom hebben we ook zoveel mogelijk vier bij jaar wisselen we van plek. Dus de volgende periode zal het weer horeca weer worden. En zo proberen we steeds te wisselen dat iedereen aan bod komt.

Spreker 2: Ja. Ik zat natuurlijk ook zelf na te denken over wat zou ik dan willen maken en wat zou ik ze dan qua vaardigheid nog aan willen leren. En ik nou, zou dan graag willen weten wat jij daarvan vindt. Ik zat zelf te denken aan bijvoorbeeld, wat ik ook al eerder zei, het leren van zeefdrukken. Dus dat je bijvoorbeeld je eigen kledingstuk kan personaliseren. Dus bijvoorbeeld een T-shirt of een tas of zoiets, dus dat ze echt zelf een ontwerp daarvoor kunnen maken en dan die sjabloon en dan het echte zeefdrukken zeg maar.

Spreker 1: En welke motorische vaardigheden moet je dan hebben? Moet je kunnen knippen? Moet je kunnen tekenen? Moet je om kunnen gaan met de computer? Wat verwacht je dan?

Spreker 2: Ja, eigenlijk dus het inderdaad het kunnen knippen van de sjabloon. Maar eventueel als dat niet mogelijk is, dan zou dus een begeleider of de ontwerper zeg maar daarbij kunnen helpen. Het kunnen tekenen van je ontwerp en dat kan ook dan weer vertaald worden op een computerprogramma als de lijnen niet helemaal mooi recht zijn, dat soort dingen. En ja eigenlijk het verf kunnen neerleggen en verf heen en weer kunnen trekken zeg maar, en druk zetten op dat... hoe heet dat, zeefraam zeg maar. Dus wat dat betreft niet hele fijne motoriek is daarvoor nodig denk ik. Want ik had natuurlijk ook al onderzocht dat dat fijne motoriek dat dat nogal eens lastig is. Dus dat. Een ander idee wat ik had was eventueel een lamp maken. Want het idee van mijn toolkit is wel dat dat samen ook wordt gedaan met eventueel dus een begeleider of een ontwerper, dat bepaalde stappen die ze zelf dan niet kunnen uitvoeren dat daar bij wordt geholpen. Dus bij die lamp zouden zij dan kunnen ontwerpen van: nou ik wil dat die deze vorm heeft of ik wil dat hij er zo uitziet. Dan kan ik, in dat geval ik, dat dan vertalen en dat ze het dan later zelf in elkaar kunnen zetten. En dat je daar dan ook nog een beetje les krijgt over elektronica. En eventueel nog een... dacht ik nog aan een klok, dus dat je ook het klokgezicht zou kunnen ontwerpen. Of iets programmeren dacht ik ook nog aan, maar ik wist niet of dat misschien te hoog gegrepen was of niet. Want dat leek me ook nog wel een leuke vaardigheid om aan mensen aan te leren die dat interessant vinden.

Spreker 1: Ja, ik vind die... als ik mag kijken hè, ik vind zo'n klok

vind ik echt wel weer interessant. Want als je bij ons kijkt naar de klok, digitaal of analoog... de analoge klok wordt bijna niet meer herkend. Het is eigenlijk alleen maar digitale klok, want ja, op een telefoon is natuurlijk ook de digitale klok. Maar zou je zoiets kunnen bedenken van: hé, als je de analoge klok neerzet en je zet hem op 12:00, dat er dan aan de andere kant 00:00 komt te staan, omdat het dan analoog is? Of dat je zegt van: hé, zet hem op half zes, dat er dan 17:30 staat en dat er dan bijvoorbeeld ook een plaatje komt te staan met avondeten? Dus dat ze zowel analoog als digitaal is zeg maar. Ja precies. En dat ze... want het is belangrijk dat onze kinderen leren van hé, dit is klok, dit is tijdsbesef, maar ook: hoe kan ik het eraan koppelen van hé, oh, het is acht uur, dat betekent 20:00, dat betekent Goede Tijden Slechte Tijden. Of dat ik zeg van 21:30, daar komt een plaatje bij: hé, dan is het tijd dat ik naar bed ga. Dus dat ze zo leren van tijdsbesef. Wat nu roep ik wel eens: hé, de rijst moet 8 minuten koken. Ja, maar wat is nou 8 minuten? Wat kan ik nou doen in het tijdsbestek van 8 minuten? Nou, dan kan ik van hier naar de Albert Heijn lopen en terug. Nou, dat red ik net in 8 minuten. Of dat tijdsbesef, dat is wel een belangrijke.

Spreker 2: Oké.

Spreker 1: En zo dingen is ook bijvoorbeeld met geld en het besef van: hé, wat is nou de waarde van geld? Is €1,40 dan heb je heel veel muntjes, is dat nou minder waard als één briefje van 5 bijvoorbeeld? En hoe duur is nou een fiets bijvoorbeeld zo? Dus in het tijdsbesef vind ik belangrijk en ja, en als je het over waarde hebt van geld, dat vind ik ook iets wat me nu te binnen schiet, dat vinden ze ook ontzettend lastig.

Spreker 2: Oké.

Spreker 1: En die andere dingen, wat vond je daarvan? Dus die bijvoorbeeld die lamp of iets programmeren?

Spreker 2: Ja, vind ik leuk. Programmeren vind ik ook leuk. Toevallig vandaag kwam er een jongen bij mij in de klas en die had een robot gemaakt en die robot kon zo lopen. Dat was ook interessant, want hoe heb ik dit nou in elkaar kunnen knutselen. Dus die nieuwsgierigheid is er wel zeg maar.

Spreker 1: Oké. Ja, ik heb nog wel een vraag. Heb jij vaak het gevoel dat mensen met syndroom van Down worden onderschat in wat ze kunnen?

Spreker 2: Ja, altijd. Iedere dag.

Spreker 1: Ja, dus dat er wordt gedacht van: nou zij kunnen niet dit en dat maken of dit en dat doen, maar eigenlijk kunnen ze het best goed.

Spreker 2: Ja. Ja, nou ja, en ook de manier waarop de mensen omgaan met mensen met het syndroom van Down, hoe neerbuigend mensen zijn, dat merk ik iedere dag dat ik denk van: hoe haal je het in je hoofd.

Spreker 1: En op wat voor manier is dat dan?

Spreker 2: Nou, ongevraagd aanraken, ongevraagd met onze leerlingen knuffelen, het ook toelaten dat mijn leerlingen opeens een wildvreemde in de aula dat ze die vastpakken. Dus andersom hè, dus dat mijn leerlingen iemand anders

vastpakken en dat iemand dan ook blijft staan: oké hé, dit zal er wel bij horen. Terwijl als een andere 20-jarige dat zou doen, zouden ze hopelijk daarvan af duwen van: hé luister, wat overkomt me nu. Maar dat onderschatten, ja, dat is ook echt heel groot. Dat nog steeds de mensen tegen mij gaan praten als ze iets te vragen hebben over mijn leerlingen.

Spreker 1: Ja. En merk je ook dat ze vaak worden buitengesloten? Of dat niet zozeer?

Spreker 2: Nou ja, nee, dat gevoel heb ik juist veel minder. Maar dat is ook omdat onze leerlingen best wel op andere mensen af durven te stappen. Dus ze hebben wel het zelfvertrouwen om bij een ander te gaan zitten. Waar ik nog wel eens schaamte voor voel van: hé, zou ik zomaar naar iemand toe gaan om even een praatje te maken? Of als ik in de trein zit en ik ga naast iemand zitten dat ik denk van: hé, ik maak geen praatje. Ja, dan zijn hun toch vaak wat spontaner en die beginnen gelijk met te kletsen en die hebben dat gevoel minder denk ik. Dus buitensluiten, ja daar zorgen ze zelf voor dat dat niet zo erg gebeurt denk ik. Maar dat is het eerste contact hè. Dus dat zijn niet mensen die ze daarna nog uitnodigen om vriendschap aan te gaan bijvoorbeeld. Dus het oppervlakkige, het eerste contact, daar vind ik dat ze niet in buitengesloten worden.

Spreker 1: Nee. En buitengesloten qua... ja maar dat heeft misschien dan weer te maken met het onderschat worden, maar qua dingen dus maken, dus bijvoorbeeld koken en dat soort dingen, daar worden ze dan denk ik misschien wel vaker in buitengesloten, dat ze denken van: nou dit kunnen jullie dus niet, dus dit doen jullie niet.

Spreker 2: Ja. Nou ja, en dat kom je ook heel vaak tegen op stages bijvoorbeeld. Dat ze soms wel verrast zijn van: oh, ik had niet gedacht dat ze dit al zouden kunnen of bijvoorbeeld een jongen bij de horeca van: zo, hij kan echt heel netjes snijden, hij weet alles precies in blokjes te kunnen snijden of in julienne of in reepjes of in... dus dan worden ze ook wel eens... stagebedrijf wordt ook wel eens verrast zeg maar.

Spreker 1: Oké. Ja, ik zou graag willen weten wat hierna... we hebben nu even met elkaar gesproken, we hebben een paar dingen gedacht van: misschien is dit handig. Wat is nu je opzet, wat is nu je agenda?

Spreker 2: Ja, wat ik graag zou willen doen is dus... nou ik ga met deze informatie die jij mij nu hebt gegeven en informatie die ik in de via literatuuronderzoek heb gevonden zeg maar, doe ik eigenlijk wat ideeën gaan maken voor verschillende toolkits die ik zou kunnen gaan maken uiteindelijk. Dan zou ik het heel fijn vinden als je nog een keer met me zou willen bellen, zodat we er samen even naar kunnen kijken. Dan is het doel om in ieder geval eentje daarvan te kiezen om dan verder uit te werken. En dan zou ik het heel mooi vinden als ik misschien een keertje langs kan komen om het te testen.

Spreker 1: Ja zeker. En wil je het dan klassikaal doen? Wil je verschillende niveauleerlingen het dan laten doen of een heterogene groep of een homogene groep? Hoe wil je dat?

Spreker 2: Dat moet ik nog even naar kijken, misschien

verandert dat nog wel later, maar ik denk dat ik het wel wil doen inderdaad met gewoon verschillende niveaus. En wat ik ook mooi zou vinden is als ik het zo zelfstandig mogelijk kan maken. Dus dat ze het echt helemaal zelfstandig kunnen volgen en dat er echt minimale begeleiding is. Dat er echt alleen maar misschien samen gekeken wordt naar hoe wil je het ontwerp eruit laten zien en misschien gewoon wat introductie-uitleg zeg maar. Maar ik wil juist kijken hoe ze het zelfstandig aanpakken zeg maar.

Spreker 1: Ja precies. Omdat het proces belangrijker is dan het product wat eruit komt.

Spreker 2: Ja, eigenlijk wel, ja.

Interview B

Spreker 1: Hallo!

Spreker 2: Goedemiddag.

Spreker 1: Hoi, goedemiddag. Versta je mij goed?

Spreker 2: Ja hoor, helemaal prima.

Spreker 1: Oké, super. Nou, superfijn dat je met mij een interview wilde doen. Vind je het trouwens oké als ik de audio opneem van het interview?

Spreker 1: Ja, super, dankjewel. Ja, zoals je misschien al een beetje hebt kunnen lezen in de mail, ben ik dus nu bezig met mijn afstudeerproject van een studie hier aan de [Universiteit]. En dat is van de faculteit Industrieel Ontwerpen. En waar ik eigenlijk mee bezig ben is, ik ga verder op een onderwerp waar een professor van mij een PhD in heeft gedaan. Dus wat ik nu wil doen is eigenlijk iets ontwerpen voor mensen met downsyndroom, waarbij ik ze extra vaardigheden kan aanleren en nog verder kan gaan in die ontwikkeling. En dat wil ik eigenlijk doen door middel van een “toolkit”, noem ik dat. Dus dat kan heel veel vormen aannemen, maar ik wil dat waarschijnlijk gaan doen door middel van dat je eigenlijk een doos, een soort bouwpakket eigenlijk krijgt, dat ze iets kunnen gaan maken en met dat, via dat maken, dat ik ze wat aan kan leren, zeg maar, een vaardigheid die ze nog niet hebben. En waarom specifiek downsyndroom? Mijn tante die heeft downsyndroom, dus dat ligt voor mij dicht bij huis. En daarom vind ik het ook een mooi onderwerp om onderzoek in te doen. Dus dat eigenlijk. En ik kwam bij jullie terecht via [een deskundige] van [de Stichting]. En ik had een beetje gelezen op de website dat jullie ook verder gaan met de ontwikkeling van mensen met downsyndroom. En daarbij dacht ik dus van: “Nou, misschien dat dat goed op elkaar aansluit en dat ik jouw expertise dan mooi kan gebruiken,” zeg maar.

Spreker 2: Nou, ik ben benieuwd. Want wat had jouw professor ontworpen dan?

Spreker 1: Ja, dat was eigenlijk een “framework”, noemt hij dat. Dus dat is meer hoe designers dan iets kunnen gaan doen, iets kunnen gaan implementeren. Ze kunnen dat framework gebruiken om mee verder te gaan ontwerpen. Ja, lang verhaal, maar het gaat over “democratizing design”, dus het democratiseren van design, om mensen dus meer te betrekken bij het designproces. Dus dat het niet alleen maar de designers aan het ontwerpen zijn, maar dat iedereen in feite kan gaan ontwerpen.

Spreker 2: Ja, want ik ben wel technisch onderlegd, levensmiddelentechnoloog, dus ben geen pedagoog. Ik ben gewoon moeder en om die reden heel veel bezig met ontwikkeling van mijn kind en andere kinderen. Maar kun je een voorbeeld noemen van hoe je ontwerp dan kan democratiseren?

Spreker 1: Ja, dus wat bijvoorbeeld al is gedaan, is dat andere mensen die hebben bijvoorbeeld... nou, een lamp. Dus eigenlijk dat ik als designer bijvoorbeeld dan zeg van: “Nou, we gaan een lamp maken,” en dan mag jij als de consument

gaan zeggen: “Nou, ik wil dat hij er zo en zo en zo uit gaat zien.” Dan is misschien de volgende stap van het ontwerpproces dat ik hem ga produceren en dat jij hem dan bijvoorbeeld in elkaar gaat zetten. Dus zo dat de consument meer inspraak heeft op hoe het ontwerp er echt uit ziet. En het idee daarvan is dan ook dat het product langer in huis blijft omdat je dan trots bent op wat je hebt gemaakt. Dat is een beetje het idee daarvan.

Spreker 2: Ah, oké. Niet alles voorgerekookt en gebakken, maar...

Spreker 1: Ja, dus dat niet alle keuzes bij de ontwerper liggen, maar juist dus bij de consument, zeg maar.

Spreker 2: Ja, ja, ja.

Spreker 1: Dus ja, lang verhaal en een beetje abstract misschien. Spreker 2: En het downsyndroomverhaal? Ik begrijp jouw affiniteit dan met de doelgroep. Maar downsyndroom is natuurlijk wel heel breed, hè, in de zin van qua vaardigheden, zowel motorisch als cognitief. En als je het dan hebt over allebei, dan is er op allebei de vlakken natuurlijk een hele grote overlap met andere soorten handicaps. Om een voorbeeld te noemen: ik heb ooit een keer [mijn zoon] mee laten doen aan een wetenschappelijk onderzoek naar autisme. Heb ik hem aangemeld als referentiegroep “laagbegaafd, niet autistisch”. Geen idee of hij autistisch is, maar kijk, als mijn zoon gaat tekenen, gaat hij dit soort dingen doen. Liefst zoveel mogelijk herhaling. Dat ziet er toch een beetje autistisch uit, zeg maar. Nou ben ik geen psycholoog, maar dus die overlap van verschillende handicaps is best wel groot natuurlijk. Dus ik snap je affiniteit en het is een duidelijk zichtbare groep, maar er zit een groep bij die natuurlijk ook heel relevant kan zijn voor waar je mee bezig bent.

Spreker 1: Ja, nee, zeker inderdaad. En daar heb ik ook nog wel over nagedacht, alleen het jammerlijke van een afstudeerproject is dat het maar een half jaar duurt, en niet eens eigenlijk een half jaar, het zijn 100 dagen, 100 werkdagen. Dus wat ze hier in ieder geval op de universiteit aanmoedigen is om het niet te breed voor jezelf te gaan maken. Dus vandaar echt het gerichte op downsyndroom. En er zijn inderdaad, wat je ook zegt, overlappen inderdaad. Maar wat ik ook een beetje wil aantonen met mijn onderzoek is dat het ook toegepast kan worden voor andere doelgroepen met een ander soort handicap.

Spreker 2: Ja, ja, ja. Het is wel een makkelijke doelgroep in de zin van... er is geen handicap, misschien autisme dan, maar er is bijna geen handicap waarvan de verwanten zo goed zijn georganiseerd als bij downsyndroom. Het is heel gemakkelijk om een groep mensen met downsyndroom te vinden. Nou ja, barst maar los. Ik ben benieuwd of ik jou kan helpen met vragen die je hebt.

Spreker 1: Ja, nou ik heb vooral vragen dus echt over de doelgroep zelf en wat jullie misschien bij [de leerclub] dan doen. Dus ja, om maar gewoon te beginnen: wat is iets wat de doelgroep heel goed zelfstandig kan eigenlijk? Want ze hebben natuurlijk best wel wat begeleiding normaal gesproken, maar wat is juist iets wat ze dan heel goed zelfstandig kunnen?

Spreker 2: Ja, je stelt nu vragen over de doelgroep, hè. [De leerclub] bestaat uit vijf leerlingen en toevallig zijn dat allemaal leerlingen met downsyndroom. In dit geval zijn dat... want de doelgroep van [de leerclub] is de “VSO-verlaters”, dus het speciaal onderwijs, die klaar zijn met school maar nog niet klaar zijn met leren. Dus dat is een hele specifieke doelgroep. Het is ook een doelgroep die zin heeft om door te leren, die daar trots op is. Die vinden het jammer dat school voorbij is, die vonden school leuk. Als ze 18 zijn moeten ze stoppen als je op het VSO zit. Nou ja, goed, als je ouders goed kunnen lullen dan misschien nog tot 19 of 20, maar dat is echt niet vanzelfsprekend. Dus die mogen niet studeren zoals jij. En dat bieden wij dus aan. Maar dit zijn dus wel relatief hoogbegaafde mensen met downsyndroom. Al moet ik zeggen dat wij ook een leerling hebben die is aangemeld als zijnde: “Onze zoon kan niet lezen,” maar hij zoekt wel dingen op op internet en blijkt dat hij dus gewoon best wel een beetje kan lezen. Alleen ja, zo slecht van school af is gekomen dat hij het eigenlijk helemaal niet durft en het nu wel laat zien in een klein klasje. Dus dat is natuurlijk heel mooi. Dus het... ik ken natuurlijk wel ook andere mensen met downsyndroom, omdat het mijn omgeving is. En daar zitten er natuurlijk ook bij die veel minder zelfstandig zijn, veel minder cognitieve vaardigheden hebben en daardoor ook veel minder zelfstandigheid hebben. De vijf die hier zitten, daarvan is mijn zoon de enige die in zijn eentje op de fiets ergens naartoe mag. Afhankelijk van waar hij naartoe gaat, hoe lastig de route is, mag hij dat alleen doen. Hij kan bijvoorbeeld wel rechtsaf op de fiets, maar niet linksaf. Want linksaf is veel complexer, hè. Je moet kijken of je geen tegenliggers hebt of er niemand van rechts en niemand van links komt, achterom kijken. Dat kan hij echt niet, dat is levensgevaarlijk. Maar als hij naar de avondschool gaat, dan hebben we een route uitgedokterd waarbij hij twee keer lopend oversteekt en voor de rest alleen maar rechtsaf hoeft. En dan kan hij zelf fietsen, als hij zich aan de afspraken houdt, wat een hele belangrijke voorwaarde is, want dat kan mijn zoon, die kan zich aan afspraken houden, meestal. Maar in ieder geval zodoende dat ik er vertrouwen in heb dat hij heel aankomt als ik hem uitzwaai als hij daarnaartoe gaat. Dan is er één leerling die altijd op de tandem zit, dus die kan of mag niet zelf fietsen. Of hij het niet kan, dat weet ik niet, maar ik begrijp zijn moeder dat ze hem niet op een fiets naast haar zet of een fiets in het schuurtje zet waar hij de sleutel van heeft. En van één weet ik het niet. Oh ja, dat weet ik wel. Ik denk niet dat die fietst. Die mag pas sinds kort een autoluwe straat oversteken zelf. Dus die wordt overal aan het handje mee naartoe genomen. En dan zijn er nog twee meiden die heel veel fietsen, maar altijd naast hun ouders. Dus als het gaat over zelfstandigheid, dan zit daar al heel veel verschil in, terwijl ik je heb uitgelegd dat het best wel een uniform groepje is. En soms is het ook heel erg complementair. Ik hoop dat de informatie die ik je geef nuttig is, hoor, want ik hoop dat ik jouw vragen goed begrijp en ook je nuttige dingen vertel. Maar mijn

zoon heeft op [de leerclub] een vriend en [de zoon] die is een vrij ingetogen, serieuze jongen. Als hij naar de disco gaat, dan vindt hij dat zijn dansmoves moeten passen bij de muziek. Dus dan gaat hij hakken of het is hardrock. Maar als er dan andere jongens met downsyndroom de zaal binnenkomen die... dan heeft hij zoiets van: “Die zijn gek.” Maar hij heeft een vriend die veel opener is en heel veel mensen aanspreekt en altijd aan je zit. Dus het zijn hele verschillende karakters. Maar zij kunnen samen naar de bioscoop, terwijl ik het voor allebei alleen eigenlijk niet een goed idee vind. Want [de zoon] die... ja, die zou niemand aanspreken, die zou een beetje “grumpy” zitten kijken en heel serieus naar die film gaan. Hij zou popcorn kunnen kopen en drinken en hij heeft zijn bankpas mee, maar ik zou het een beetje zielig vinden. Maar als hij met zijn vriend gaat, die dus absoluut geen bankpas heeft en die tegen iedereen gaat zitten lullen, wat hartstikke gevaarlijk is, want iemand kan hem ook meenemen bij wijze van spreken. En die komt ook te laat, komt niet in de juiste zaal aan. Maar hun met z’n tweeën is perfect. Want [de zoon] die zegt dan tegen hem: “Doe niet zo gek, we moeten nu naar de zaal, het is tijd.”

Spreker 1: Dat is een goede combinatie, zeg maar. Ze vullen elkaar goed aan.

Spreker 2: Ja, precies. Terwijl ze allebei echt heel duidelijk een handicap hebben en allebei om hun eigen reden dat niet alleen zouden moeten doen in mijn beleving. Maar als setje, ja, is het precies eigenlijk dat het net wel kan. En dat is natuurlijk super leuk. Dus ja, en als je dan kijkt naar wat... ik ben ook met een wooninitiatief bezig. En oh, dat is misschien wel leuk om jou die slide te laten zien. Want daar hebben we zeg maar voor de verschillende partners een presentatie gemaakt om uit te leggen waarom wij zulke hoge eisen stellen aan de plek waar we die woongroep willen laten landen. En dus als je het hebt over levensgeluk en je hebt het over zelfregie, wat een onderdeel is van levensgeluk, ja, dan is het bijvoorbeeld heel belangrijk dat je aan een veilige straat woont, in een veilige wijk, met sociale mensen, maar ook vlakbij een supermarkt. Zodat ze, als ze een keer zelf hun lunch mogen organiseren, ook zelf even lopend naar de supermarkt kunnen waar ze een pakje kaas en een broodje kunnen halen. Dat is natuurlijk super belangrijk. Dat is voor normale mensen heel vanzelfsprekend. Maar als je deze mensen in [een stad] ergens op de berg ofzo neer zou zetten, waar het fietsen veel lastiger is en waar geen supermarkt in de buurt is, een villawijk, hè, je koopt met z’n allen een grote villa en daar zet je ze neer, ja, daar raken ze een heel groot gedeelte van hun vrijheid kwijt. En dus, maar ook bijvoorbeeld... ik weet niet of je het Afrikaanse sprookje over... ik weet niet meer hoe dat heette, maar het gaat om wat je kan. En moest geloof ik een kind een steen optillen. En die vader of die wijze heer die zei van: “Dat kan jij.” En nou, dat kon hij natuurlijk niet, want dat was een steen net zo zwaar als hij, en dat kind vond dat echt heel naar dat hij zo gechallenged werd. Maar de clou van het verhaal was: “Jij kan dat, want jij kan om

hulp vragen.” En dat is natuurlijk heel belangrijk, dat je in een situatie bent waarbij je hulp kan vragen en ook weet hoe je dat moet doen, waardoor je wereld gewoon veel groter wordt.

Spreker 1: Ja, nee, zeker.

Spreker 2: Ik was al vergeten wat je vraag was. Dingen die ze zelfstandig kunnen, hè. Ja, dat is dus heel verschillend. Maar als je kijkt naar het programma “Kleine Stapjes”, ken je dat?

Spreker 1: Nee.

Spreker 2: Heeft [de deskundige] dat niet verteld?

Spreker 1: Nee, die heeft dat niet verteld, nee.

Spreker 2: Er is een app, en vroeger waren het boeken. Het komt uit Nieuw-Zeeland, waar natuurlijk zorg altijd heel ver weg is. Voor ouders om zelf zeg maar... het is een zelfhulpmethode voor ouders om de motorische ontwikkeling van hun kind goed te volgen en in hele kleine stapjes te kunnen herkennen om te kijken waar de volgende stap is om te oefenen. En er is nu een app van. Vroeger waren het boeken. Heb ik ze gescand? Ja, volgens mij heb ik dat ook gescand. [Fragment verwijderd]. En dat is bij een spraakwerval is dat... “Kleine Stapjes”. Volgens mij heb ik er een Excel van gemaakt. Ja, “Kleine Stapjes inclusief aanvulling”. Ik kan dat beeld delen, toch niet?

Spreker 1: In principe wel, ja.

Spreker 2: Even kijken hoor, waar zit jij nu? Ja, daar ben je. Delen. Hoe zie je jezelf?

Spreker 1: Ja, ik zie nu het scherm inderdaad.

Spreker 2: Kijk eens, fijne motoriek. Zie je het nu?

Spreker 1: Nee, ik zie de... oh ja, nu zie ik de Excel, ja.

Spreker 2: En dus de grove motoriek... ik heb dat ooit een keer dus allemaal zitten intypen blijktbaar. En reikt naar een stukje speelgoed, rolt vanuit de buikligging bij toeval en terug. Echt heel gedetailleerd. Wat is LL? Leren lezen om te leren praten. Persoonlijke sociale vaardigheden. Receptieve taal. Fijne en grove motoriek. En dat zijn best wel hele lange lijsten. Die wil ik je wel sturen. Dit is hopeloos verouderd, want [mijn zoon] is ondertussen 23. Dus zoals ik al zei... nou ben ik je helemaal kwijt. Ik wil dit knopje doen. Het is weer net anders dan op mijn werk. Nou zie je mij weer, hè?

Spreker 1: Ja.

Spreker 2: Oké. En dus dit is ook een soort toolkit, hè, een ontwikkelings-toolkit voor ouders die misschien samen met een fysiotherapeut of een ergotherapeut of een logopedist zelf die juiste stapjes willen aanbieden aan hun baby of kleuter of peuter om zodoende zeg maar zonder al te veel frustraties die ontwikkeling zeg maar op gang te houden.

Spreker 1: Ja, mooi voorbeeld inderdaad. En ja, als je dat naar mij zou kunnen sturen, zou ik dat heel fijn vinden.

Spreker 2: Ik laat hem openstaan, dan kan ik het niet vergeten.

Spreker 1: Oh, super, dankjewel. Ja, wat eigenlijk mijn volgende vraag was, of nou in jouw geval dan je zoon, maar misschien weet je het ook van de andere leerlingen van [de leerclub], of zij ja, iets hebben gemist op school wat ze altijd graag hebben willen leren? Of dat ze misschien tegen jou hebben gezegd

van: “Nou, ik zou zo graag nog dit willen leren of kunnen willen doen of een vaardigheid die ik wil ontwikkelen?”

Spreker 2: Ja, heb je even? Van deze vijf leerlingen... van één weet ik het niet, maar van de anderen weet ik het wel. Hebben er drie op gewoon basisonderwijs gezeten. En één iemand niet, en van de vijfde weet ik het niet. En ik heb ook veel verhalen gehoord van mensen die op een gegeven moment hun kind ook op het basisonderwijs hebben gehad en daarna middelbaar onderwijs naar het VSO moesten. En dat er dan toch heel erg veel ingeleverd moest worden aan ambitie en aanbod. [Mijn zoon] is wel een uitzondering, want die heeft na de basisschool heeft hij praktijkschool gedaan. Dus hij is eigenlijk altijd behoorlijk uitgedaagd geweest. En op het praktijkonderwijs was het verschil niet zo groot met de andere leerlingen. Hij had bijvoorbeeld op zijn HACCP, voedselveiligheid horeca-cursus, had hij een hele dikke voldoende. Maar dat heeft hij wel gehaald omdat ik die hele horeca voedselveiligheid-richtlijn heb opgeknipt in werkbladen. Je spreekt hier denk ik met kampioen Nederland werkbladen maken. Ik heb echt iets van 12 gig aan lesmateriaal in mijn computer zitten, allemaal zelfgemaakt. En dat was niet omdat ik nou zo nodig elke avond achter de computer wilde zitten om aardrijkskunde, geschiedenis, natuur, verkeerslessen, Engels, om alles aan te passen zodat hij mee kon komen op de basisschool. Maar het moest wel. Want op het moment dat kinderen met downsyndroom zijn niet alleen moeilijk lerend, maar ze zijn vooral ook langzaam lerend. En op een gegeven moment, ja, ze groeien toch groter en je kan een kind met downsyndroom niet vijf jaar in groep 3 houden als hij er vijf keer zo lang over doet. Dat gaat gewoon niet. Dus wij zijn al begonnen met het leren van de letters en globaal woorden. I weet dus niet welk ontwikkelingsniveau jouw tante heeft, maar heeft zij ooit kunnen leren lezen?

Spreker 1: Ja, nee zeker. Ze is volgens mij vrij hoog ontwikkelingsniveau, ja.

Spreker 2: Oh ja. Met [mijn zoon] zijn we gewoon vanaf het begin begonnen met woorden aan te bieden. En dan had ik een doos met spulletjes verzameld waarin plastic eten zat en plastic dieren en allerlei andere dingen en kaartjes met woorden. En dan maakte ik met die kaartjes de zin, ik noem maar wat: “Kip eet appel.” En dan moest hij de kip uit de bak pakken en een appel. En dan moest hij, want hij kon niet praten, dus hij kon niet laten zien dat hij het... en dan moest hij dat laten zien dat hij dat snapte. En dat was eigenlijk als doel om hem beter te leren praten, want dan had hij steun aan die woorden. Om een voorbeeld te noemen: hij heeft namelijk ook een gehemeltlespleet gehad en was zeer slecht verstaanbaar de eerste jaren. Hij zei “nee” en “mama” en hij kende 300 gebaren. En toen ben ik met hem gaan lezen en de eerste twee woorden die ik hem heb aangeboden waren “vis” en “krokodil”. Lekkere grote verschillen. En ik had toevallig ook een plastic vis en een plastic krokodil. En het derde woord wat hij zei was “krokodil”. Dat is bizar. Daar krijg je kippenvel

als moeder, hoor, als je dan op een gegeven moment je kind dan opeens “krokodil” ziet. En dat was puur omdat zijn hoofd anders werkt dan bij anderen. Zijn auditieve geheugen is gewoon veel slechter dan zijn visuele geheugen. Het zit ook in een ander stuk in de hersenen. En door het woord krokodil te zien en de cadans in dat woord te zien, is hij dat woord gaan zeggen. Nou, dat was allemaal voor de basisschool, dus vanaf een jaar of drie ofzo zijn we dat gaan doen. En toen op een gegeven moment toen moest hij dus van de kleuterklas naar groep 3. En toen gingen ze dus met letters leren lezen. Dus toen heb ik allemaal letterlessen gedaan. Dus toen heb ik een hele doos gemaakt met ook weer een “toolbox”, zeg maar, waarin ik elke keer een andere letter ging verstoppen. Bijvoorbeeld, ja, dan waren we toe aan de ‘P’, en dan nou, dan gingen we pannenkoeken bakken met poedersuiker en stroop. En dan maakte ik een kartonnen blad en dan knipte ik de ‘P’ uit en die deden we dan op de pannenkoek en poedersuiker erop en dan stond er een ‘P’ op de pannenkoek. En met de andere pannenkoek de ‘P’ met stroop erop. En dan was de hele maand was in het thema van de ‘P’ en de ‘P’ hing ook in de badkamer en er was een sleutelhanger met een knop en als je daarop drukte zei hij “p p”. Verzin maar wat. En ja, goed, dan kom je in een klas en dan kende hij het hele alfabet al in groep 3. En begonnen we met de methode en twee maanden later waren alle kinderen hem voorbij. Was hij de hele voorsprong kwijt. Hadden we een jaar aan gewerkt of anderhalf jaar. Dus ja, je moet behoorlijk ambitieus zijn om mee te mogen doen op het gewoon basisonderwijs, want de andere kinderen zijn gewoon veel sneller. En wat mis je dan? Ja, je mist aangepast lesmateriaal. Dus op een gegeven moment kom je dan op het punt dat je naar groep 5 gaat en dan krijg je aardrijkskunde, geschiedenis en natuur. En die boeken houden echt geen rekening met het feit dat er nog iemand is die AVI 3 of 4 leest. Want het is de bedoeling dat je dan AVI 8 ofzo leest. En dan moet je wat. Want dan gaan ze zeggen op school van: “Ja, nou, nou moet hij toch maar naar speciaal onderwijs, want nou kan hij met zo weinig dingen nog meedoen.” “Ja, nee, ik ga dat allemaal wel aanpassen.” Dus toen heb ik voor hem allemaal werkbladen gemaakt zodat hij na het verhaaltje voor de klas en de bespreking met de juf... en jij kan je dat allemaal veel beter herinneren hoe dat vroeger ging dan ik.

Spreker 1: Ja, klopt inderdaad, ik ben ook 23.

Spreker 2: Ja, precies. Maar hij had dus zijn eigen werkboek met vereenvoudigde... over Rollo de slaaf of ik noem maar wat uit die tijd, of over materialen van Nout. Ik weet niet of je dezelfde methodes hebt gehad. En dat was dan allemaal aangepast. Dus ja, welke aanpassingen waren nodig? Ja, heb je even? Het heeft me de afgelopen 20 jaar duizenden uren gekost om hem door dat onderwijssysteem heen te slepen. En het alternatief was dat hij dus naar het ZML ging en helemaal geen geschiedenis en helemaal geen natuur en helemaal geen aardrijkskunde ging krijgen, maar ‘s morgens de regendans ging doen. Ja, het klinkt een beetje cynisch, maar...

Spreker 1: Ja, want is dat ook echt waar je op inlevert als je het dus van het normale onderwijs zeg maar naar het VSO of ZML gaat zeg maar? Of zijn er nog meer dingen waar je op inlevert, zeg maar? Zijn dat ook bijvoorbeeld... ik had vroeger op school had ik bijvoorbeeld ook handvaardigheid en dat soort dingen. Werd dat daar dan ook niet gedaan of...?

Spreker 2: Ik denk dat ze eigenlijk alles wel doen, dus ook leeslessen geven enzo. Maar dat de verwachtingen heel laag zijn. En hij heeft nooit op speciaal onderwijs gezeten. Dus ik kan hier eigenlijk niet vertellen wat hij daar wel aangeboden had gekregen, maar dat is van horen zeggen. En wat ik vooral een heel groot verschil vind, en dat zeggen de docenten ook: de aangepastheid van [de leerclub] is... mijn kind de enige die niet iedereen om de hals vliegt. Dus als zo’n dag voorbij is, dan... zeg maar, hij heeft zijn emoties beter onder controle, hij weet wat sociaal aangepast gedrag is. En dat als je alle mensen met een handicap bij elkaar zet en de docenten zijn daar ook helemaal aan gewend, dan... oh! Wacht even hoor, er valt een heel gek beest uit mijn haar. Dat vind ik ook een beetje zielig om hem te vermoorden. Je hebt even pauze, ik ga hem even naar buiten brengen. Gek torretje, maar hij mag wel blijven leven. Ja, maar goed, wat moet je ermee als je ontwerper bent met... kijk, lesmateriaal is wel echt het eerste wat in me opkomt als je zegt van: “Wat had aangepast moeten zijn, wat had modulair moeten zijn?” De methode “Veilig Leren Lezen”, “Veilig Leren Lezen Stap voor Stap”, de groep 3 en 4 methode, die was er in twee niveaus. Daar heb ik weinig aan hoeven doen. En die methodes van [een uitgeverij]... op een gegeven moment hebben ze ook geaccepteerd, ze hebben mij ook geholpen om die materialen die ik gemaakt heb om die zeg maar te publiceren. En ik had het eerst in Excel gedaan, totaal onhandig, maar goed. Dat was mijn eerste idee, en toen hebben zij dat zelfs omgezet in een PDF. Want je zit dan natuurlijk ook met plaatjes waar copyright op zit, dus ik had hun gevraagd: “Mag dit?” Qua publicatie komt er binnenkort een website “Cognitieve Dagbesteding”, die heb ik net tig giga aan lesmateriaal gestuurd. Maar ja, wel met de opmerking dat het wel achter een wachtwoord moet, want ik heb natuurlijk allemaal plaatjes van internet gejat. Dus een toolbox met bijvoorbeeld gratis plaatjes of... daar zitten gewoon heel veel behoeftes bij ouders. Uitlegboekjes op niveau, aangepaste lesmethodes, methodes op verschillende niveaus.

Spreker 1: En als je dan kijkt naar volwassenen met downsyndroom, zie je daar nog onderwerpen in wat mist, wat toe zou kunnen voegen aan hun leven? Bijvoorbeeld op het gebied van maken of creativiteit?

Spreker 2: Vind ik een hele moeilijke. Qua koken hebben we bijvoorbeeld wel altijd dat we de recepten aanpassen, maar dan kom je weer op dat cognitieve. Qua maken... we zijn niet heel erg bezig met creatieve dingen. We hebben wel eens een thema gehad waarbij er iets gemaakt werd, we hebben bijvoorbeeld het thema “afval” gehad en hebben een afvalmonster gemaakt. Maar dan zie je gewoon wel dat... je

hebt dan zelf een idee van hoe zoiets eruit zou kunnen zien en je spaart materialen op, maar dat vinden ze dan best wel heel moeilijk om zoiets in elkaar te zetten. En dat wordt natuurlijk stevig begeleid. Ze hebben bijvoorbeeld wel eens een rap gemaakt en hun eigen naam in graffiti gemaakt. Maar dat is ook best wel lastig voor ze. Laat een kind met downsyndroom een kameel tekenen en je krijgt iets heel grappigs, hoor. Het ziet er echt heel anders uit, ook anders dan bij een kind van 8 jaar. Want ze hebben wel bepaalde vaardigheden, maar je ziet heel duidelijk dat ze bepaalde verbanden en strategieën niet hebben om zoiets te gaan tekenen. Dat is ook eigenlijk hun eigen kracht, dat het dan iets heel apart wordt.

Spreker 1: Ja, want is er bijvoorbeeld ooit geopperd van: “Ik zou graag een stoel willen maken of een lamp willen maken, of iets met elektronica?” Of worden die wensen niet eens uitgesproken?

Spreker 2: Die worden niet uitgesproken, maar ik vind het wel heel inspirerend. Het brengt me wel op een idee voor [de leerclub], om te kijken of we daar ook nog iets aan kunnen doen.

Spreker 1: Ja, want dat is misschien ook wel een beetje waar ik naartoe wil, om te kijken inderdaad of ik het zo kan maken dat volwassenen met downsyndroom dan bijvoorbeeld zelf hun eigen stoel kunnen ontwerpen en in elkaar kunnen zetten. En dat dat op zo'n manier wordt uitgelegd dat ze dat bijna helemaal zelfstandig kunnen doen. En dat ze dan echt kunnen zeggen van: “Kijk, die stoel heb ik gemaakt.” Dat lijkt me heel vet om te kunnen aanbieden, maar mijn vraag is of je denkt dat dat gewild is en echt iets toevoegt. Ik wil namelijk niet iets gaan maken voor het maken.

Spreker 2: Ja, ik zit heel hard te denken. Ja, echt een gebruiksartikel. Het zou wel heel vet zijn natuurlijk. Ik ben nog nooit op het idee gekomen om [mijn zoon] daarbij te betrekken. Ik heb wel eens gedacht aan knutselen met een stekkerdoos of wat dan ook, want dat lijkt me dan ook eigenlijk wel gevaarlijk als hij dat soort gewoontes krijgt. We hebben nog wel als gedachte om een keer een pot te gaan laten kleien, dat is motorisch ook best wel ingewikkeld om te doen. Als ik naar het werk kijk... [mijn zoon] die werkt in een eetcafé. Moet hij de was vouwen en strijken, dat kan hij. Hij snijdt groenten, dat kan hij ook. Hij bedient mensen, dat kan hij ook. Afruimen gaat wat knulliger. Hij kan met drie borden lopen, dat heeft hij op school geleerd en examen in gedaan, maar hij zal het nooit zo uitvoeren. Hij sjouwt de borden gewoon naar de tafel. Het ligt soms meer aan de ambitie van de begeleiders dan aan wat hij kan. Het risico is natuurlijk ook wel groot als het bord eraf flikkert. Maar hij werkt ook bij een winkeltje waar ze dingen maken. Hij mocht altijd van die kartonnen vazen versieren. [Mijn zoon] kan best mooi tekenen. Maar in dat winkeltje vinden ze dat hij zich niet kan houden aan hun stijl. Hij tekende dan de [naam van brug] op zijn manier met allemaal blokjes. Maar dat was niet goed genoeg; hij moest bloemen tekenen en die vulde hij dan ook weer met blokjes.

Toen kreeg hij getekende bloemen die hij moest inkleuren, maar dat deed hij ook niet zoals zij dat wilden, want hij zegt: “Ik ben een kunstenaar en ik heb mijn eigen stijl.” En nu zit hij op een A4-tje te tekenen. [Fragment verwijderd]. Dat is voor mij natuurlijk heel lastig, want hij kan naar dat werk toe lopen, hij vindt het fantastisch. Maar ja, in feite hadden we dat werk gekozen omdat hij zo ontzettend leuk vindt om te tekenen. Hij had pentekeningen gemaakt bij zijn tekenjuf. Het zijn zwartwit tekeningen, en ik heb die bewerkt in Word, alsof de zwarte streepjes uitgeëtst zijn in een kleur. En daar heb ik kaarten van laten drukken. En die heb ik ook gegeven aan [het winkeltje] zo van: “Hij kan wel wat.” Maar daar zijn ze niet gevoelig voor, want zij zitten helemaal aan hun eigen “brand”. En er werken daar ook heel veel laagbegaafde mensen die dus niet zo eigenwijs zijn als [mijn zoon], die het leuk vinden om de hele dag kettinkjes te rijgen. [Mijn zoon] wil dat best een dag doen, maar daarna wil hij eigenlijk liever zelf een ontwerp maken.

Spreker 1: Ja, snap ik. Die simpele herhalende taken, dat vindt hij eigenlijk helemaal niets.

Spreker 2: Nou, maar daar komen we wel ergens, want [een andere medeleerling] die werkt bij een bakkerij. Ze kan goed lezen en schrijven, maar volgens mij is haar dagbesteding redelijk vaak elke keer appeltaart bakken. Dat is toch eigenlijk wel zielig. Vind ik, hè. Ik zal dat niet tegen die ouders zeggen. Ik ben blij dat [mijn zoon] in de horeca werkt, want dan ziet hij elke keer andere gerechten en mensen. Maar dat zou natuurlijk wel iets zijn, als je die saaie dagbesteding... als je iets zou kunnen bedenken waardoor er toch elke keer een eigen impact mag zijn.

Spreker 1: Ja, een eigen impact. Dat is ook eigenlijk een beetje wat ik met die toolkit wil doen. Dat ze het zelfstandig kunnen doen, hun eigen input erin kunnen stoppen en er eventueel nog wat van leren.

Spreker 2: Ja, en als je het dan hebt over jouw vakgebied, design, dan denk ik dat [de leerclub] niet zo'n hele goede bakermaat is om ideeën op te doen, maar zo'n winkeltje of zo'n appeltaartfabriek juist wel. Er zijn heel veel van dat soort ateliers waar dingen worden gemaakt door mensen met een handicap, maar soms mag je dan dus ook niet meedoen. Hij heeft een slechte dag als er geen afvalpapier is, want dan mag hij geen papier scheuren. Dat doet mij echt verdriet als ik dat soort dingen hoor. Hij kan natuurlijk veel meer. Hij mag dan de kasten afstoffen en tekenen op een papiertje. Ja, dat is toch een soort van handelingsverlegenheid van de begeleiders of een gebrek aan creativiteit. Daar zitten best wel heel veel verbetermogelijkheden.

Spreker 1: Ja, ik ben zelf nog een beetje zoekende naar welk onderwerp ik dan zo'n toolkit zou willen maken wat echt wat toevoegt.

Spreker 2: Misschien kun je dan toch proberen om te kijken wat voor soort dagbesteding deze mensen hebben en wat je zou kunnen doen om het geestdodende van herhalende taken

te verbeteren. Voor mensen die motorische beperkingen hebben, maar ook waar de begeleiding beperkt is. Het zou heel fijn zijn dan stuur ik weer een mailtje. als er een manier zou zijn om ze wel hun creativiteit kwijt te kunnen laten raken zonder dat het... ik heb bijvoorbeeld ooit voor hem zijn naam laten uitslijpen in een metalen plaatje, zodat hij zijn naam op zijn tekening kon zetten. Hij kon nog helemaal geen letters, maar hij kon zo wel [zijn naam] erop zetten. Als je zoiets zou kunnen bedenken, sjablonen waardoor hij bijvoorbeeld ook glas zou kunnen beschilderen omdat hij dan automatisch binnen die lijntjes blijft, en het ook telkens dezelfde stijl wordt. Want op het moment dat je dat zou doen, kun je daar verschillende stijlen in kwijt. Ik heb hier zo'n plastic ding dat je op een pannenkoek kunt leggen en als je er poedersuiker op doet, verschijnt er een bloemenboeket. Heb je toch zelf iets moois gemaakt, dat kan niet misgaan.

Spreker 1: Nee precies, dus dan misschien dat hij ook zelf zijn eigen sjabloon zou kunnen ontwerpen. Of dat je met die taart-problematiek een stempel hebt waardoor hij zijn eigen koekjes kan bakken met zijn initialen erin.

Spreker 2: Ja, of die appeltaart... dat het dan gewoon ook niet mis kan gaan, dat je niet zo'n vervelende opdrachtgever hebt die zegt dat het er telkens hetzelfde uit moet zien. Dat je eigenlijk zorgt dat het wel eigenheid heeft, maar dat het ook niet te veel mis kan gaan of kan ontsporen in: “Nou ja, dat het er zo uit gaat zien dat niemand het gaat kopen.” Want dat snap ik ook wel, het is dan gewoon een kindertekening.

Spreker 1: Oké. Nou ja, ik heb denk ik nog wel veel voor mij om over na te denken. Ik zie trouwens dat de meeting bijna afloopt. Ik weet niet of je nog tijd hebt?

Spreker 2: Ja, hoor, ik heb geen deadline nu. Ik ben wel nieuwsgierig wat het gaat worden. En als je het leuk vindt om bij [het winkeltje] of bij de bakkerij te gaan kijken, dan kan ik wel een lans voor je breken en kijken of je daar kan interviewen.

Spreker 1: Ja, dat zou ik sowieso heel leuk vinden inderdaad. En misschien dat ik ook een keer langs kan komen bij [de leerclub]?

Spreker 2: Ja, natuurlijk mag dat. En dan wil ik je ook al die materialen laten zien die ik heb gemaakt om te zorgen dat hij in kleine stapjes mee kan doen. Dan zou je dat op een maandag kunnen doen; eerst bij [de leerclub] langs en daarna bij [het winkeltje] en de bakkerij.

Spreker 1: Ja, super. Is het goed als ik daar dan nog een mailtje over stuur voor wanneer dat handig is? Misschien dat ik dan ook al iets mee kan nemen wat ze alvast kunnen testen.

Spreker 2: Ja, tuurlijk. Als jij zegt van: “Nou, ik heb toch een lamp in gedachten, en ik wil het graag uittesten,” dan moet je maar zeggen hoeveel tijd je daarvoor nodig hebt. We gaan het binnenkort eens over het brein hebben bij [de leerclub], dat wordt het nieuwe thema. We gaan met visuele illusies aan de slag en testjes van je eigen brein. Dus als jij een testcase hebt en je wilt dat met vijf relatief slimme mensen met downsyndroom uittesten: “Be my guest.”

Spreker 1: Nou, dat vind ik super leuk om te horen. Ik ga nog even brainstormen met alle informatie die ik heb gekregen en dan stuur ik weer een mailtje.

Interview C

Spreker 1: Goedemorgen.

Spreker 2: Hoi, goedemorgen. Hoor je mij?

Spreker 1: Ja, hoor je mij ook goed?

Spreker 2: Ja, ik zal je even iets harder zetten, anders hoor ik je niet. Zo.

Spreker 1: Helemaal goed. Dank u wel dat u met mij wilde afspreken. Ja, ik zal misschien nog even wat meer vertellen over het onderzoek dat ik doe, misschien wel interessant voor u om te weten. Ja, eigenlijk ga ik verder met een PhD van een van mijn professoren aan de TU Delft. En hij heeft onderzoek gedaan naar eigenlijk een soort tweesplitsing die ooit is ontstaan na de industriële revolutie van dat de ontwerpers alles ontwerpen voor de mensen die het gebruiken en dat de mensen er zelf geen inspraak in hebben. En dat de consumenten zeg maar een product één keer gebruiken en daarna weggooien. Dus op het gebied van duurzaamheid is dat ook niet helemaal top natuurlijk. En hij heeft om dat op te lossen een framework voor bedacht, namelijk Design for DIY, dus Design for Do It Yourself. Zodat mensen meer betrokken kunnen worden in het ontwerpproces zeg maar. En hij had gezegd dat hij dat voor iedereen toegankelijk had gemaakt, maar daar was ik even ingedoken en toen had ik als kritiek eigenlijk op hem van: nou, het is niet voor iedereen toegankelijk. En zo ben ik uitgekomen op de doelgroep mensen met een beperking. En nu ook specifiek mensen met het syndroom van Down. En dat is voor mij een belangrijke doelgroep omdat mijn tante het syndroom van Down heeft, dus dat staat sowieso dicht bij huis. En vandaar dat ik daar ook meer onderzoek naar wilde doen. En ja, wat ik uiteindelijk wil ontwerpen is iets van een toolkit waarmee ik mensen met het syndroom van Down nog meer in hun kracht kan zetten en dat zij dan zelf nieuwe vaardigheden aan kunnen leren en dat ze er ook iets tastbaars van kunnen maken zeg maar. Dus ik wilde eigenlijk vandaag met u praten over welke barrières die doelgroep eventueel ervaart en hoe zij het beste leren. En dat eigenlijk een beetje, en ik vroeg me af wat u daarover weet.

Spreker 2: En barrières, barrières voor wat? Ik bedoel, bij alles denk ik: wat bedoel je nou eigenlijk?

Spreker 1: Nou, om te beginnen bij de barrières, dan bedoel ik eigenlijk fysieke of cognitieve barrières die mensen met het syndroom van Down ervaren.

Spreker 2: Oké, maar daar gaat het je dus eigenlijk om. Mensen betrekken in het ontwerpproces. Eigenlijk wil je de ontwerper ook een handvat geven van hoe je mensen daarbij kunt betrekken.

Spreker 1: Ja.

Spreker 2: Oké. Er was een reclamebureau in [stad], die had een aantal mensen met downsyndroom daarin betrokken voor reclame maken. Dat moet ook in die stukken gestaan hebben. Ik weet niet precies waar. Meer info, kennisbank... waar zou dat onder staan? Beeldvorming, zou ik dat verwachten. Beeldvorming... even kijken hoor. Moeilijk... Ah, dit

is hem. Download 101, pagina 53. Je kan hem bereiken via die kennisbank. Beeldvorming, en dan 'ontwerper de prestaties door mensen met downsyndroom'. Of eerst beeldvorming...

Spreker 1: Ja, ik ben even met u mee aan het schrijven. Ik ga even kijken of ik hem ook online kan vinden.

Spreker 2: En dan download 101. Beeldvorming, reclame mannen. Dat zijn van die korte stukjes hoor. Maar het is in ieder geval waar die mensen met downsyndroom er echt bij hebben betrokken.

Spreker 1: Ja.

Spreker 2: Is misschien toch een leuk voorbeeld.

Spreker 1: Even kijken hoor... nou ik zoek deze zo nog even op. Ik heb het in ieder geval opgeschreven. Dan ga ik daar nog even naar kijken.

Spreker 2: Waar ben je nou gebleven? Een hoop knopjes heb je. Kan je die niet weer vinden? Onder het Teams-knopje denk ik. Ah, daar heb je ze. Nee, nee, een ander tabblad van internet.

Spreker 1: Oh, oké.

Spreker 2: Dat is wel een aardig voorbeeld van in ieder geval het actiever betrekken van mensen met downsyndroom bij het creëren, in dit geval van reclameboodschappen.

Spreker 1: Oké.

Spreker 2: Maar ja, barrières... Kijk, als je een toolkit hebt en mensen moeten dan een hoop lezen met een hoop moeilijke woorden, dan is het niet toegankelijk voor mensen met downsyndroom.

Spreker 1: Nee, precies. Dus dat is ook een van de dingen waar ik nu ook naar aan het kijken was, was eigenlijk misschien inderdaad een instructiekit ontwerpen wat misschien wat meer plaatjes erin verwerkt dan taal.

Spreker 2: Nou, ik wou zeggen, het tweede is dan dat je dus dingen kunt aanvullen met beeldmateriaal of met filmpjes. Dus dat het... filmpjes kunnen ook heel goed werken. Kijk ook eens op de pagina's op onze site... Ik moet even zoeken hoe je die moet vinden. Ik denk 'meer info'... Ik moet even zelf zoeken naar de site. Meer info, handige brochures... En dan voor jongeren en volwassenen met downsyndroom. Er zijn allerlei materialen die voor de mensen zelf bedoeld zijn. Voor jongeren en volwassenen... ah ja, ik zie het inderdaad. Dat zijn allemaal materialen, specifiek niet voor jouw onderwerp, maar wel ontworpen voor de doelgroep.

Spreker 1: Ja, precies. Nee, dat is zeker ook heel waardevol. Dan kan je misschien toch iets uithalen van wat is er nodig. Even kijken hoor of ik nog meer kan vinden. Levensloop... tiener... Als je naar de levensloop gaat, dus als je eerst 'home' doet, dan zie je als bovenste 'levensloop', dan kan je klikken op 'tiener'. En dan zie je 'voor de tiener zelf'. En dan als je een terug gaat, had je ook 'volwassenen' kunnen kiezen. En daar staat hij ook: informatie voor volwassenen zelf. En dat was met name gericht toen op iets zinnigs met je vrije tijd doen. Want dat bleek in gesprekken met volwassenen behoefte aan te zijn. Dat ze zeiden van: ja, ik zit met vrije tijd en ik weet gewoon niet hoe ik het moet invullen. Dus daar gaven we ideeën van

hoe doe je dat. Dus daar was het voornamelijk op gericht. Dat is zeker heel interessant, want dat is ook nog een vraag die ik eigenlijk had voor u inderdaad: is er überhaupt behoefte voor het maken van dingen bij volwassenen met downsyndroom?

Spreker 2: Ja, maar omdat er zo weinig ingevuld is, kan ik er geen houvast op krijgen. Kijk, het enige wat ik weet is dat mensen met downsyndroom vaak kunst maken. Of omdat ze zelf enorme drang hebben, of omdat ze op een dagbestedingsplek zitten waar dat gedaan wordt. Allebei komt voor. Zitten ook hele verdienstelijke kunstenaars bij die echt wat kunnen. Als je doorbladert door die kennisbank, zie je allemaal van die verwijzingen, dan kom je dat wel tegen. Dat is ook een vorm van maken. Maar ja, design klinkt toch meer als gebruiksvoorwerpen.

Spreker 1: Ja, het kan eigenlijk van alles zijn. Het kan inderdaad gebruiksvoorwerpen zijn, maar het kan ook kunstzinnige dingen zijn. Het is wat dat betreft eigenlijk vrij breed. Dus dat maakt het misschien ook wel lastiger.

Spreker 2: Niet zo een beetje lastiger. Ja, verder zeg je: wat is typisch voor mensen met downsyndroom? Ze zijn een stuk korter. En dat is wel opvallend. Ik heb het ooit beschreven, die zei van: ja, dan kan die een eigen huis krijgen, maar hij kan niet bij de keukenkastjes. Die zijn te hoog. Dus ook bij design heb je daar dus mee te maken, bijvoorbeeld bij een binnenhuisarchitectuur.

Spreker 1: Ja.

Spreker 2: Ze zijn vaak... mensen met down zijn allemaal verschillend hè. Maar vaak hebben ze toch wel een wat beperktere fijne motoriek. Dus als het allemaal heel nauwkeurig moet, dan gaat het niet. Uitzonderingen daargelaten. Er zijn altijd wel weer mensen bij wie dat niet voor geldt. Maar vaak is het zo dat de motoriek vraagt om niet te klein en niet te priegelig. Nou, cognitief hebben we het al over gehad. Spraak is vaak een beperking, dus zul je het verstaanbaar moeten maken. En dan kan het wel helpen om met formats te werken waarbij mensen meer keuzes kunnen maken. Dus dat heb je toch al een beetje een idee in welke richting je het moet zoeken.

Spreker 1: Ja, dat je eigenlijk een aantal opties geeft en dat ze daaruit kunnen kiezen zeg maar.

Spreker 2: Bijvoorbeeld ja. Of dat je met plaatjesmateriaal werkt van: in welke richting zie jij het? Dan moet je maar eens bij die reclamejongens kijken, want die zullen er toch ook tegenaan gelopen zijn. Verder wat ik leuk vond om te lezen, was een stuk in de krant over [Naam kunstenaar]. Dat is een kunstenaar met downsyndroom en dat is nogal een aparte. Hij wilde er eigenlijk niks van weten dat hij downsyndroom heeft, maar goed, dat heeft hij wel.

Spreker 1: Ja. Weet u dat misschien? Bijvoorbeeld zelf bij mijn tante vragen wij ons nog steeds af van: weet zij nou eigenlijk dat ze downsyndroom heeft? Weet u of mensen dat echt weten dat ze het hebben?

Spreker 2: Nou ja, ik weet alleen wat ouders daarvan denken.

Zeg een kwart weet het. Maar dat moet ik voor je opzoeken, de precieze getallen. Ik heb dat ook wel eens gevraagd in een enquête. Waar zat die? Die zal ook wel in de kennisbank wonen. Dat zal onder zelfbeeld vallen. Even kijken of ik daar iets zie. Oh nee, het zit dus alles onder de psychosociale ontwikkeling, die is heel breed. Oké, ik zal eens kijken hoe het daarin staat. Nee, daar staat het nog niet in. Ik ben echt verbaasd. Psychosociale ontwikkeling, daar moet hij tussen zitten. Download 119, pagina 40... nee, pagina 44. De vraag: heeft de persoon zelf besef van dat hij een verstandelijke beperking heeft? Als je daar bij volwassenen kijkt, is dat ongeveer een kwart van de ouders die het gevraagd hebben: ja. Maar dan heb je de volgende categorie: de persoon heeft het wel in de gaten, maar weet eigenlijk niet echt wat het is. Dat is best 37%. Dus die kunnen wel vertellen dat ze het hebben, maar eigenlijk weten ze zelf niet goed wat het inhoudt. Dan de persoon weet heel goed dat hij een verstandelijke beperking heeft... oh nee sorry, die kwart is... ik heb het verkeerd gelezen. De persoon weet helemaal niet dat hij een verstandelijke beperking heeft, dat was een kwart. Dan heb je 37% die weten het wel, maar die weten eigenlijk niet wat het inhoudt, niet echt. Dan heb je 17% die weten het wel, maar die willen het er niet over hebben. Die ontkennen het liever. En dan heb je 10% die daar ook wel gefrustreerd of verdrietig over kan zijn. En dan heb je een kwart die beseffen het, die begrijpen het en die zitten er niet mee. Niet echt. Ja, dat is het beste wat ik ervan kan zeggen. Je komt daar terecht als je... het is download 119, pagina 44. En we hebben het ook gevraagd bij kinderen en bij pubers. Nou ja, dan krijg je natuurlijk andere getallen. Daar is de hoeveelheid die van niks weet natuurlijk groter dan de hoeveelheid die eronder lijdt kleiner. Je ziet ook dat het na verloop van tijd toeneemt dat ze het weten. Er zit niet heel veel verschil tussen de 13 tot 20-jarigen en de ouder dan 21-jarigen. Dus het is vooral bij de kinderen die nog geen idee hebben, maar dat is logisch. Maar goed, een deel weet het wel, een deel weet het niet, een deel weet het wel maar weet niet echt wat het is, een deel weet het wel maar die ontkent het en zegt gewoon van... ja die wil, een beetje zoals [Naam kunstenaar] van: ik heb het wel maar ik heb het niet. En een deel die zoiets heeft van: nou ja, ik heb het wel, ik weet wat het is en ik heb er niet echt last van. Die dus ook heel tevreden over hun leven zijn blijkbaar. Dus ja, dat wisselt.

Spreker 1: En merkt u ook vaak dat mensen met down zich ook eerder buitengesloten voelen uit de maatschappij?

Spreker 2: Dat is ook een goeie vraag, die hebben we ook gesteld denk ik. Maar het punt is: ik kan de mensen zelf... we hebben een enquête ooit onder mensen zelf gedaan. Kijk nu eerst even in die ouderen-enquête of die erin zat die vraag, want ik denk het wel. En dan is het dus aan ouders gevraagd. Niet hier, die zit in een andere. Die zal ik ook nog even zoeken. Dit is een hele bijzondere hoor. Download 122, onder hetzelfde kopje zou je hem vinden. Ook onder psychosociale ontwikkeling, maar dan download 122. Daar kan je ook zien wat ze in vrije tijd doen.

Misschien ook handig om te weten. Sociale contacten hebben we toen gevraagd. Oh, daar konden mensen zeggen of het mager, neutraal, ruim of niet van toepassing was. Dus die kan je bekijken. En dat buitengesloten waar we het over hadden... er staat wel iets over. Dat is dus download 122 en dan op pagina 52. Wordt of voelt de persoon met downsyndroom zich wel eens gediscrimineerd? Voelt hij zich wel eens gediscrimineerd bij de volwassenen? Nou ja, een kwart ongeveer. Volgens de ouders dan hè. Want al deze enquêtes die worden altijd ingevuld dan door ouders.

Spreker 1: Ja.

Spreker 2: Nou, we hebben er één onder mensen met downsyndroom van 12 jaar en ouder. Die zal ik ook voor je opzoeken. Maar goed, bekijk dat maar, dan heb je toch enigszins een idee. Download 118, pagina 40... ervaringen en gevoelens van tieners en volwassenen. Dus we hebben eerder ouders en broers en zussen de vragenlijst laten invullen en deze is door mensen met downsyndroom zelf ingevuld. Maar ze mochten daar wel hulp bij krijgen. Want ja, anders wordt het te ingewikkeld. Maar de instructie aan degene die hulp geeft is: je moet wel zorgen dat de persoon zijn eigen mening geeft en niet de jouwe. Want je eigen stempel erop drukken, dat moet natuurlijk niet. Er staan veel open vragen bij zie je. Dus: wat zou je willen vertellen aan nieuwe ouders van een baby met downsyndroom? Dat was een van de vragen. En daar krijg je: gefeliciteerd, God zegene jou, proficiat. Wat een volkomen adequate reactie is. Een kwart wil zeggen: downsyndroom is niet erg. 'Ik heb een goed leven' 33%. 'Downsyndroom is leuk en niet erg' 28%. Dat komt wel een beetje overeen met die andere cijfers volgens mij. 'Ik wil geen downsyndroom hebben' 9%. Zelfde percentage als bij die enquête onder ouders. Dus dat is dan toch wel grappig dat ze eigenlijk dan hetzelfde zeggen.

Spreker 1: Ja.

Spreker 2: Maar dat verwacht ik ook wel, want ouders kennen hun kind vaak wel heel goed. Je hebt natuurlijk ook wel weer eens van die gekke ouders die het ook ontkennen, maar als hulpverlener zou je er gewoon vanuit moeten gaan dat de meeste... voor de meeste geldt dat ze het gewoon... dat ze kennis hebben.

Spreker 1: En wat doet u precies bij Stichting [vereniging]? Bent u vooral onderzoeker of schrijver van de bladen?

Spreker 2: Ja, allebei. Dat ligt ook wel in elkaars verlengde. Want ik schrijf ook over onderzoek in de bladen. Ook wel in wetenschappelijke tijdschriften, maar dat zijn vaak de wat hardere onderwerpen. Bijvoorbeeld hoeveel kinderen er geboren worden of hoeveel mensen er zijn. En enquêtes nemen we... enquêtes hebben we ook wel gebruikt zeg maar voor vergelijking tussen regulier onderwijs en speciaal onderwijs en hun resultaten. Dat heb ik wel in een Engelstalig tijdschrift gepubliceerd. Ik zal het maar even verklappen: mensen met downsyndroom leren meer op een gewone school, ook als je corrigeert voor IQ en dat soort zaken. Omdat gewoon het

aanbod rijker is. Gaat het met iedereen? Nee. Dat kan niet. Maar als het lukt, profiteren ze daarvan. Dus ze leren meer op een normale school zeg maar, met extra ondersteuning hè, want die zit er altijd bij. En die is ook een van de dingen die het verschil maakt, het feit dat er een-op-een begeleiding is. Terwijl op de speciale school alles in groepjes gedaan wordt. Dat is niet de meest ideale situatie voor iemand met downsyndroom om iets te leren.

Spreker 1: Wat is de beste manier voor kinderen met downsyndroom om te leren? Zijn er ook speciale technieken voor los van dat ze persoonlijke begeleiding hebben?

Spreker 2: Visueel. Visueel maken. En als iemand kan lezen, maak daar alsjeblieft gebruik van. Dat hoeft niet heel goed lezen te zijn om het al gebruik van te kunnen maken. Je kan er ook dingen heel kort beschrijven en... want dat beklift. Als je alleen maar praat, dan gaat het ene oor in en het andere oor uit. Dat wordt minder goed onthouden. Maar ook plaatjes, foto's in de communicatie is ook heel goed. Doe het niet overdreven kinderachtig. Want op een gegeven moment heb je wel iemand tegenover je die misschien sociaal-emotioneel een kleuter is, zogenaamd. Maar wel de levenservaring van een 16-jarige heeft. Dan moet je niet doen alsof je een kleuter tegenover je hebt. Dus ja, je moet je op alle manieren aanpassen aan de ontwikkelingsleeftijd, maar je moet het niet op zo'n manier doen dat die persoon het gevoel geeft dat hij een kleuter is. Want dat is het natuurlijk niet zo. Gebruik niet te idioot lange zinnen als je praat. Je hoeft ook niet heel onnatuurlijk te gaan praten, maar pas je tempo aan. Dus praat wat rustiger, niet overdreven langzaam, maar wat rustiger verteld en wat kortere zinnen. En geef mensen voldoende tijd om op je te reageren. Omdat er zit vaak een soort vertraging op de lijn. Dus voordat de informatie terugkomt, dat kan gewoon even duren. En dus moet je een pauze inlassen van: ik heb je nu de tijd... en je moet je toch ook altijd wel een beetje verdiepen in die persoon. Want wat ik zei: ze zijn niet allemaal hetzelfde. Dus wat bij jouw tante werkt, hoeft niet per se bij een ander te werken.

Spreker 1: Ja, klopt. Ik wil later in het proces ook gaan valideren wat ik ga ontwerpen bij mensen met downsyndroom. Heeft u daar tips voor hoe ik het beste in aanraking kan komen met een groep mensen in de doelgroep?

Spreker 2: Hoe oud moet ze zijn?

Spreker 1: Ik denk 18 tot... niet per se een bovengrens. Ik denk gewoon vanaf volwassenen.

Spreker 2: Vanaf 18, oké. Dagbesteding kom je dan terecht. Er zijn ook een paar onderwijsprojecten die door ouders zijn opgestart, die zouden het misschien ook leuk vinden. Ik zoek even waar die staan. Kennisbank, onderwijs, vervolgopleiding na voortgezet onderwijs... ah ja. Download 143: '[Onderwijsproject C], [Onderwijsproject D] en de [Onderwijsproject B]'. Daar staan drie projecten genoemd. En dat zijn door ouders opgezet voor oudere tieners en jongvolwassenen om ze toch nog wat te leren. En die zouden

het misschien interessant vinden om als leerervaring voor hun deelnemers kunnen ontwikkelen. Dus dat vind ik wel bij passen. Maar je deel te nemen. Dat zou je kunnen proberen. En [Onderwijsproject C] in moet verder de contactgegevens denk ik gewoon van internet [plaats]... waar zit [Onderwijsproject C]? Volgens mij in Den Haag ofzo. Ik halen. ga even opzoeken. [Onderwijsproject C]... hij zit in [plaats]. Oké. En die andere, [Onderwijsproject D]? Die zit elders in het land. Het is wel een beetje reizen voor je, maar ja...

Spreker 1: Dat vind ik niet erg.

Spreker 2: Want als je echt een co-creatie wilt maken, dus echt in gesprek met je doelgroep van: wat willen jullie? Dan zou ik beginnen met de begeleiders en de organisatoren van: dat je samen met hen eens overlegt wat zou geschikt zijn voor de doelgroep en dan met de doelgroep aan het werk gaat. Want ik denk dat die onderwijsprojecten gewoon het leukste zijn omdat die het waarschijnlijk bij hun doelstellingen eerder vinden passen. Dagbestedingen heb je natuurlijk ook overal hoor. [horeca-dagbesteding]... maar er zijn vaak ook andere van dat soort... ik weet natuurlijk niet wat er in jouw buurt zit. Rotterdam zeg je? Delft?

Spreker 1: Ja, ik woon in Rotterdam maar TU Delft inderdaad.

Spreker 2: Dan heb je de [zorgaanbieder], [zorgaanbieder], dat is gewoon een grote zorgaanbieder. Je hebt daar [zorgaanbieder]. En daar kan je gewoon gaan kijken op hun site wat voor dagbestedingen ze aanbieden en of daar iets bij zit. Vaak zijn er wel kunstateliers bijvoorbeeld of winkeltjes. Ja, dat zijn plekken waar je mensen met downsyndroom zou kunnen vinden. Maar ik denk dat die onderwijsprojecten gewoon het leukst zijn. Maar je vroeg wat ik deed... nou ik schrijf stukken voor ons blad, ik heb de helpdesk samen met een collega. Dus beantwoord de vragen via de telefoon of via mail van ouders, maar ook professionals, ook studenten. En we organiseren studiedagen met meer deelthemas. Studiedagen voor ouders en mensen uit het onderwijs vaak. Die over gedrag is heel populair, om er maar eens één te noemen. Omdat mensen daar soms met hun handen in het haar zitten als iemand niet reageert of gereageerd wordt met gedrag wat je liever niet hebt. Je kan gewoon kijken op [kennisplatform], daar staat het overzicht van de studiedagen. Maar je vroeg naar die projecten: [Onderwijsproject B] ken ik niet persoonlijk. [Onderwijsproject C] en [Onderwijsproject D] ook wel. Die hebben het gewoon allemaal zelf opgezet omdat zij ja, de zorgsector biedt het niet. Maar die willen echt dat die kinderen nog allerlei dingen kunnen leren. Dus dat vind ik er wel bij passen.

Spreker 1: Ja, dat vind ik ook wel goed klinken inderdaad. Ik ga ook nog even kijken bij [horeca-dagbesteding]. Ik had al een mail gestuurd inderdaad, maar daar had ik nog geen reactie op gekregen.

Spreker 2: Ja, anders moet je er gewoon naartoe gaan en gaan lunchen. En dan eens met de baas spreken ofzo. Je kan ook nog denken aan wooninitiatieven. Download 118... nee, dat

was hem niet. Download 152: '[wooninitiatief]'. Dat is ook een wooninitiatief. Daar wonen ze allemaal met downsyndroom, 12 jongvolwassenen. Maar daar had men ook wel zo'n mentaliteit van: we willen nog dat ze zich