

COULD AI BE A - MEANINGFUL - CREATION TOOL FOR FUTURE HAND TO BRAIN COORDINATION WITHIN ESD?

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ABSTRACT

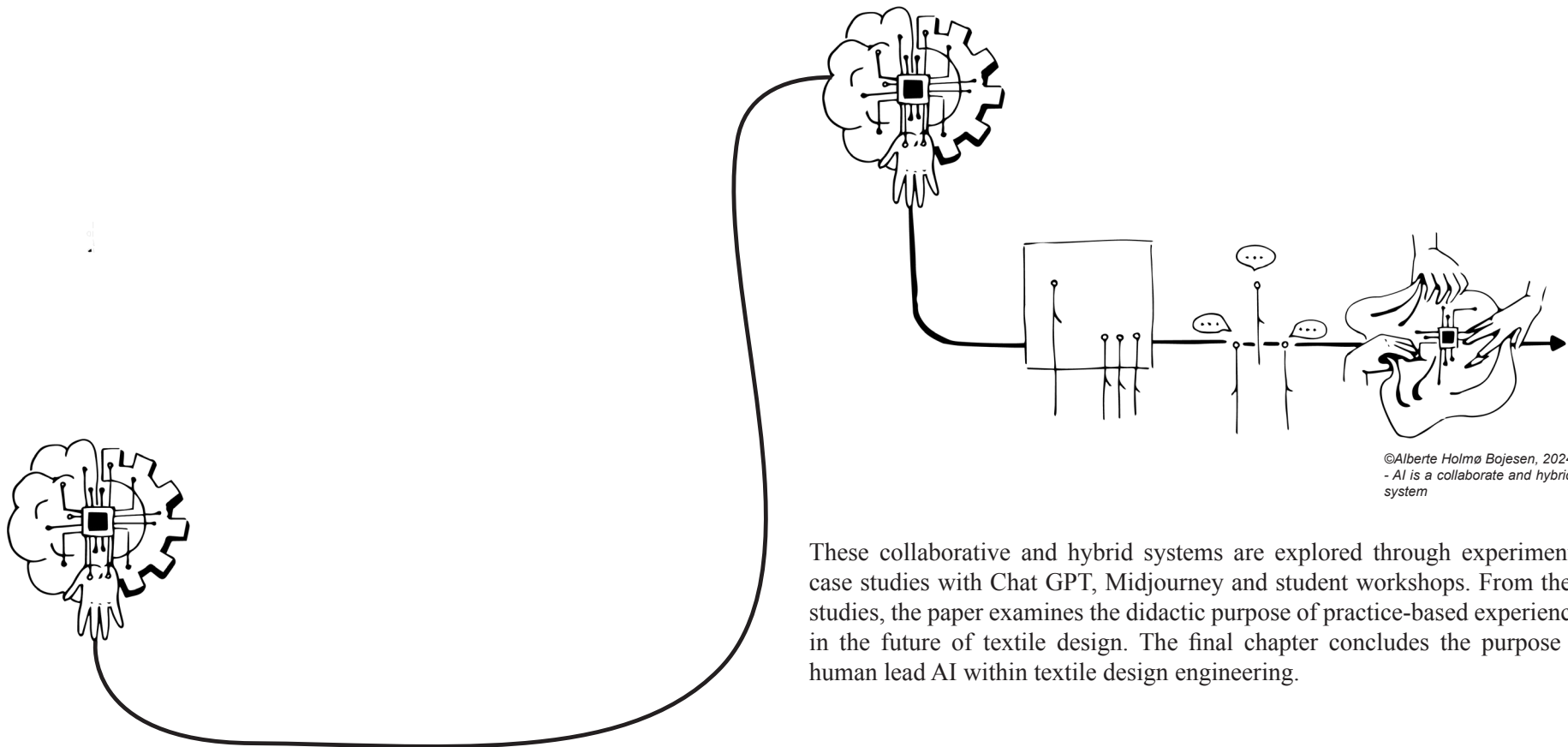
Could a visualized process of ‘transforming words into textile patterns and -products’ benefit a sustainable future of textile designs? Furthermore, could this AI-based tool be integrated beneficially in education and develop our hand-to-brain coordination in a way humans require? Let us explore a process within a drawing space - bridging the gap between ‘hands-on designing’, ‘design thinking’, and AI tools, not just by applying different design methods but also not leaving the pitch to AI: Can Mid Journey solve specific problems like how to ensure a balanced repeat for (textile) pattern design? How could the information about a new knitting machine become accessible via Chat GPT while also serving as an editing tool that is fed with more information to gain specific sustainable solutions? Our fields of interest are the design learning process for students within post-academic programs and teens at schools, as human creatives still need the embodied experiences in designing solutions, next to the aid of AI. Due to paradigm shifts in to the next genre of AI tools, ‘generative AI’ forces us as educators to face a reality in need of new rules that have to be defined right now and sketched out. This visual paper explores a balance between AI tools, sketching with various media, hands-on textile design practices, and the practices valued in a ‘textiling future’. Ultimately, the crucial question of ethical standards remains a human decision, not one to be left to AI.

Keywords: Sketching future process in hybrid formats; AI and hand brain coordination; sharing knowledge archives in ESD, human controlled AI in textile design engineering.

1 INTRODUCTION

Future requires us to work within hybrid spaces, we are analysing how the use of Large Language Models and AI art generators can live collaboratively with analog design processes, specifically within textile design engineering.

Motivation: 'AI should support their thinking. Without any content, there will be no shape' (Prix, 2022).[1]



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- AI is a collaborate and hybrid system

These collaborative and hybrid systems are explored through experimental case studies with Chat GPT, Midjourney and student workshops. From these studies, the paper examines the didactic purpose of practice-based experiences in the future of textile design. The final chapter concludes the purpose of human lead AI within textile design engineering.

2 BALANCING HAND ON TEXTILE DESIGN AND AI TOOLS IN THE CREATIVE PROCESS

2.1 How could AI be used in Textile design creation? A Case study from 2023 using Midjourney

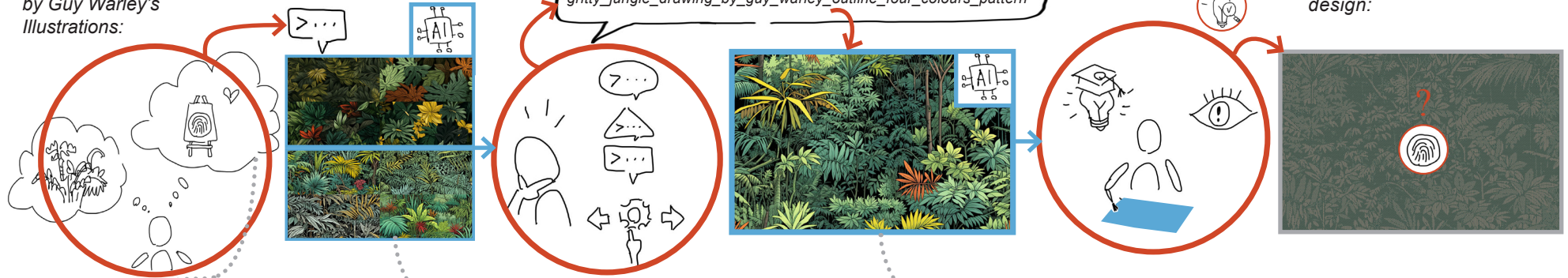
1. Designer Miko Kocon, BYBORRE (NL), starting a jungle design inspired by Guy Warley's Illustrations:

2. Experimentation with prompts using Midjourney, an image generator:

3. Analyzing and refining the prompt leads to the desired outcome:

4. Edits on details, layout & creation of the repeat:

5. Translation of scale and resolution for a pixel based knittable design:



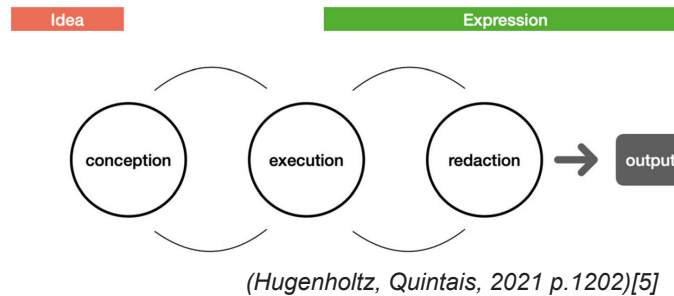
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Human & AI collaboration

'Using styles of certain artists can hurt their work, as the originals become hard to distinguish between all the generated images referencing their style' (Merz Mensch, 2023, p.52/53).[2]

Mid Journey was trained using images found on the internet made by artists without consent (Salkowitz, 2022).[3]

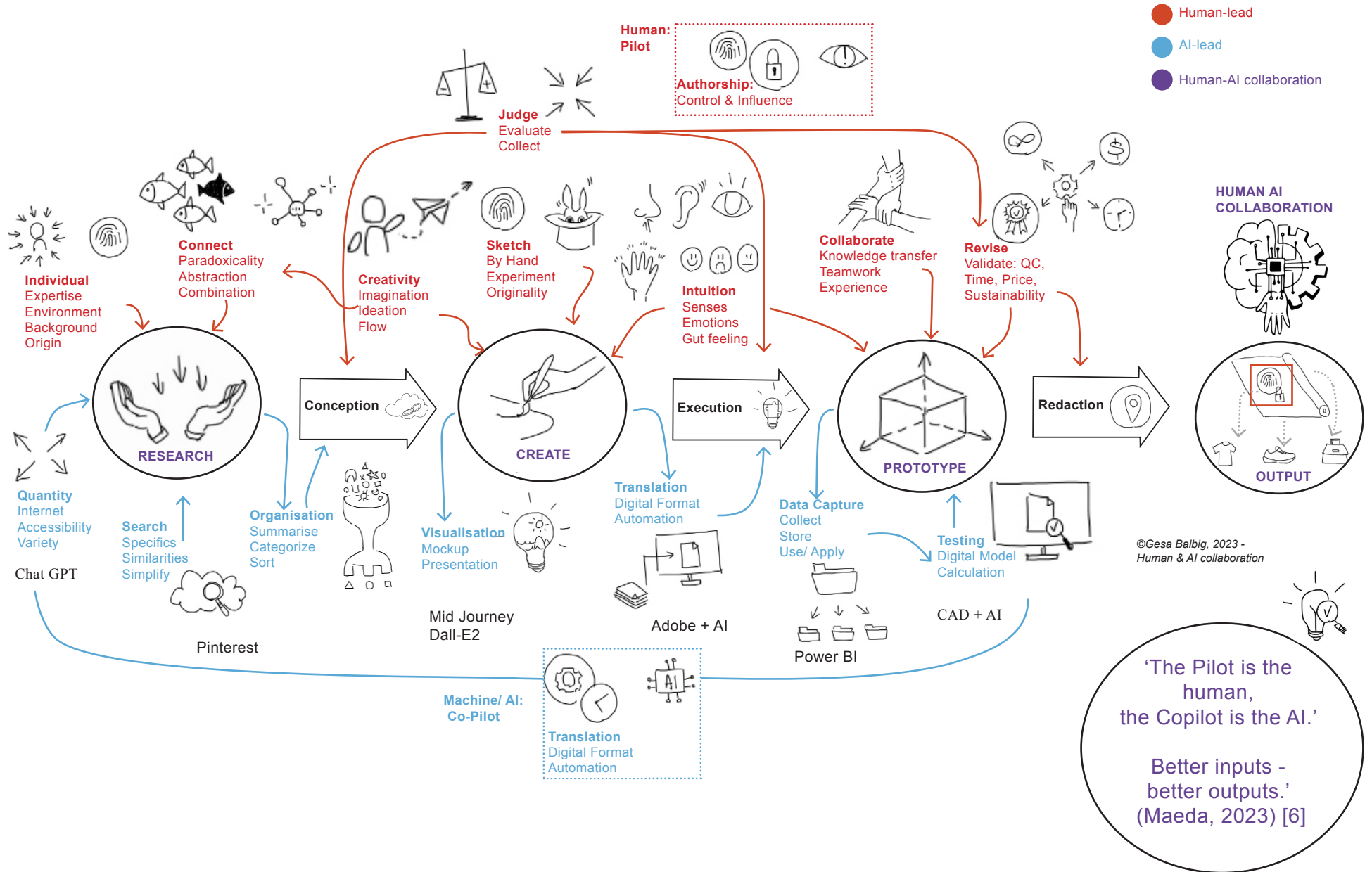
Mi'[...] Midjourney generates images in an unpredictable way. Accordingly, Midjourney users are not the "authors" for copyright purposes of the images' [...] (US Copyright Office 2023 p.9)[4]

Until specified laws like the AI EU act are passed, designers face challenges claiming authorship when using tools like Midjourney. A possible solution is using a simplified model showing the '[...] authorial choices that contribute to a finding of originality [...]' (Hugenholtz, Quintais, 2021 p.1205) [5] and make identification of human authorship more obvious.



On the following page, this model is used as a base for the textile design process with clear separation between human work and AI. AI tools should be used in areas that do not interfere with a designers authorship, resulting in a collaboration in which the designer has full control and owns the copyright.

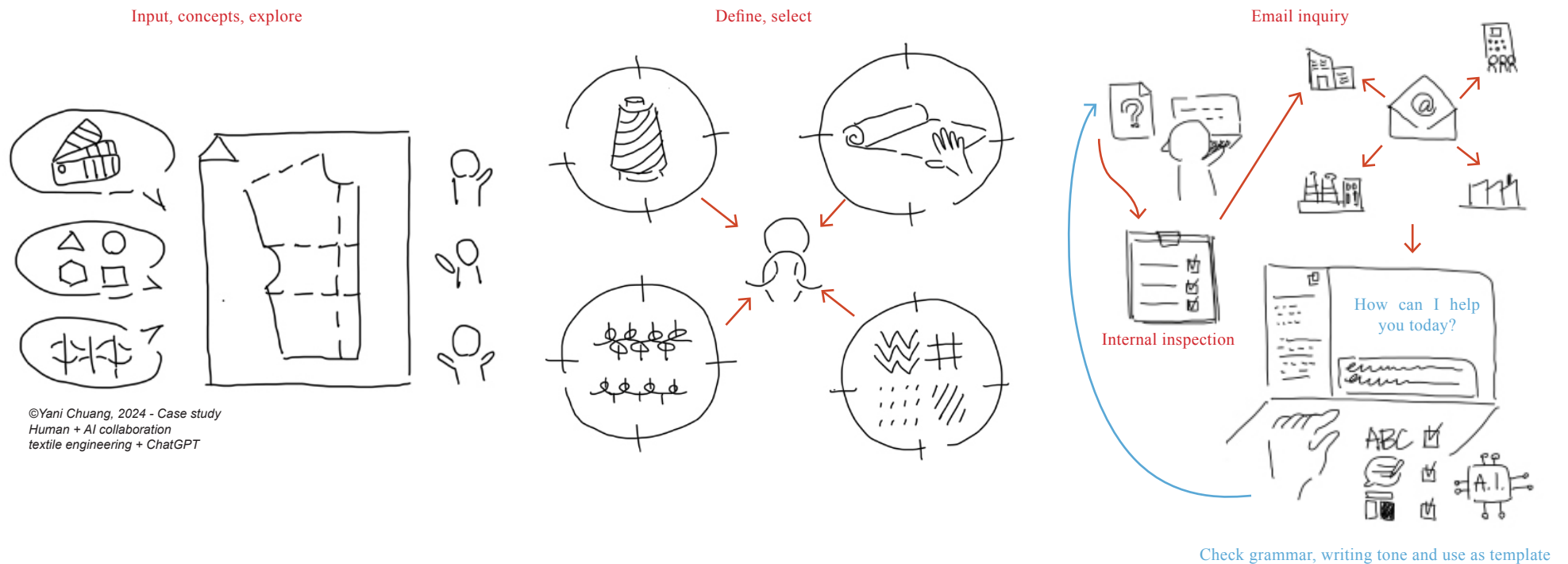
2.2 Proposing a creative process combining human and AI for Textile Design



3. HOW CAN A.I. TOOLS LIKE CHATGPT CONTRIBUTE TO THE TECHNICAL PROCESSES OF TEXTILE DESIGN ENGINEERING?

3.1 The thrust to use AI in textile engineering

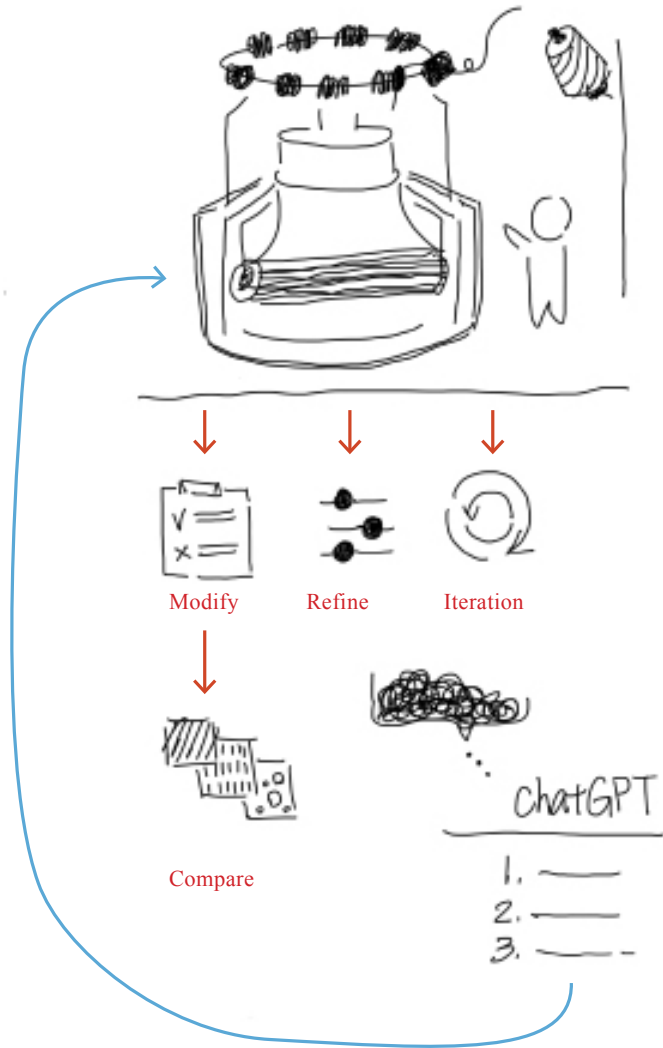
Design counts as a problem-solving discipline (Van den Boom, 2010).[7] Behind the design process lies a complex parametric which can be ‘wicked’ (Michel, 2019).[8] Visual drawings are an effective manner for hands-on professionals on how we “look” at the problem. With orientation, position, and identification it gives a better clarification of how to tackle problem-solving (Roam, 2008).[9]



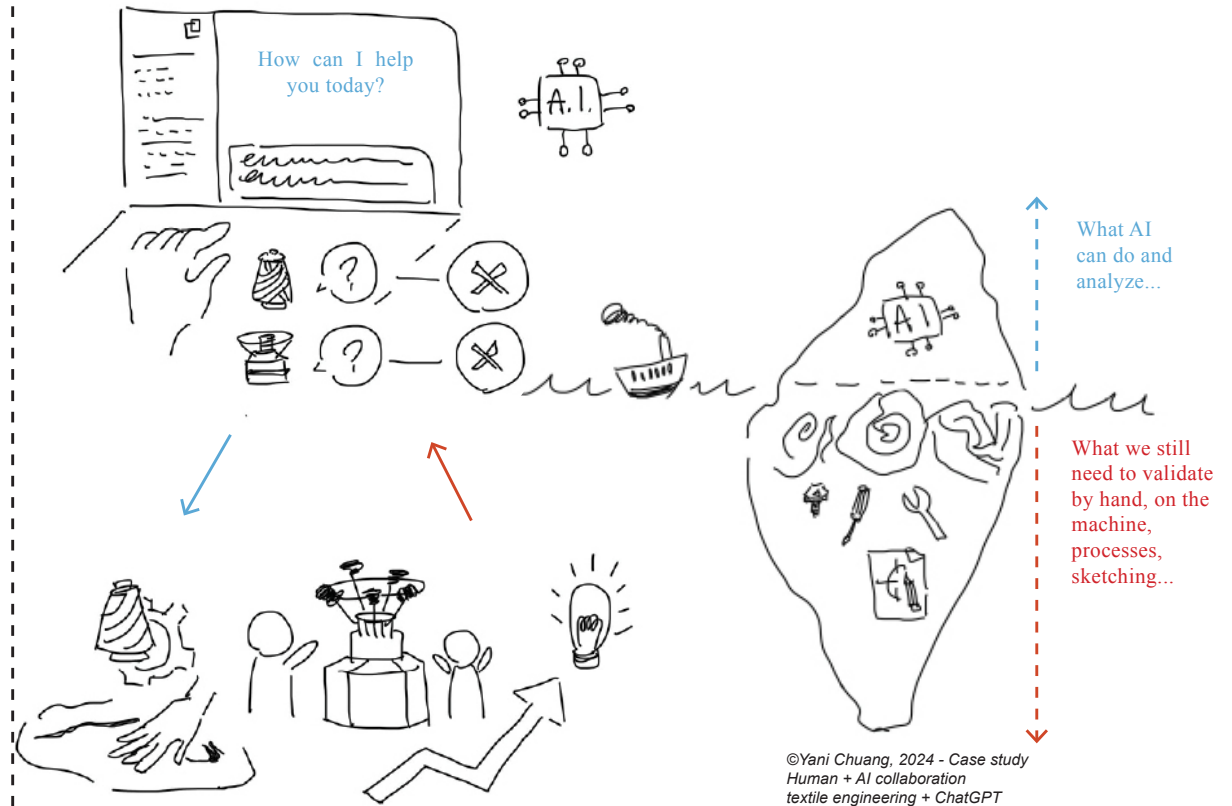
The use of digital tools and AI has the potential to improve accuracy, productivity, and operational work in the textile processes (Sikka, Sarkar, and Garg, 2022, pp. 2-6).[10]

3.2 AI generated answers cannot always be applied

AI struggles to master technical intricacies in textile engineering, or it is not the right tool. Being able to manifest tangible (Hall, 2016)[11] experience to combine concepts with mechanical practices becomes crucial for determining prosperity. How can we implement AI to improve education, prevent designing haphazardly, and create a more sustainable industry?



AI struggles with the technical complexities of textile engineering. Digital tools can support design, but complex processes make rule-based logic difficult. AI cannot yet comprehend components like machine condition, material, and textile structure outcome. Educating students and stakeholders about AI being a tool to assist and not replace designing into materiality is crucial (Wachs, 2022).[12]

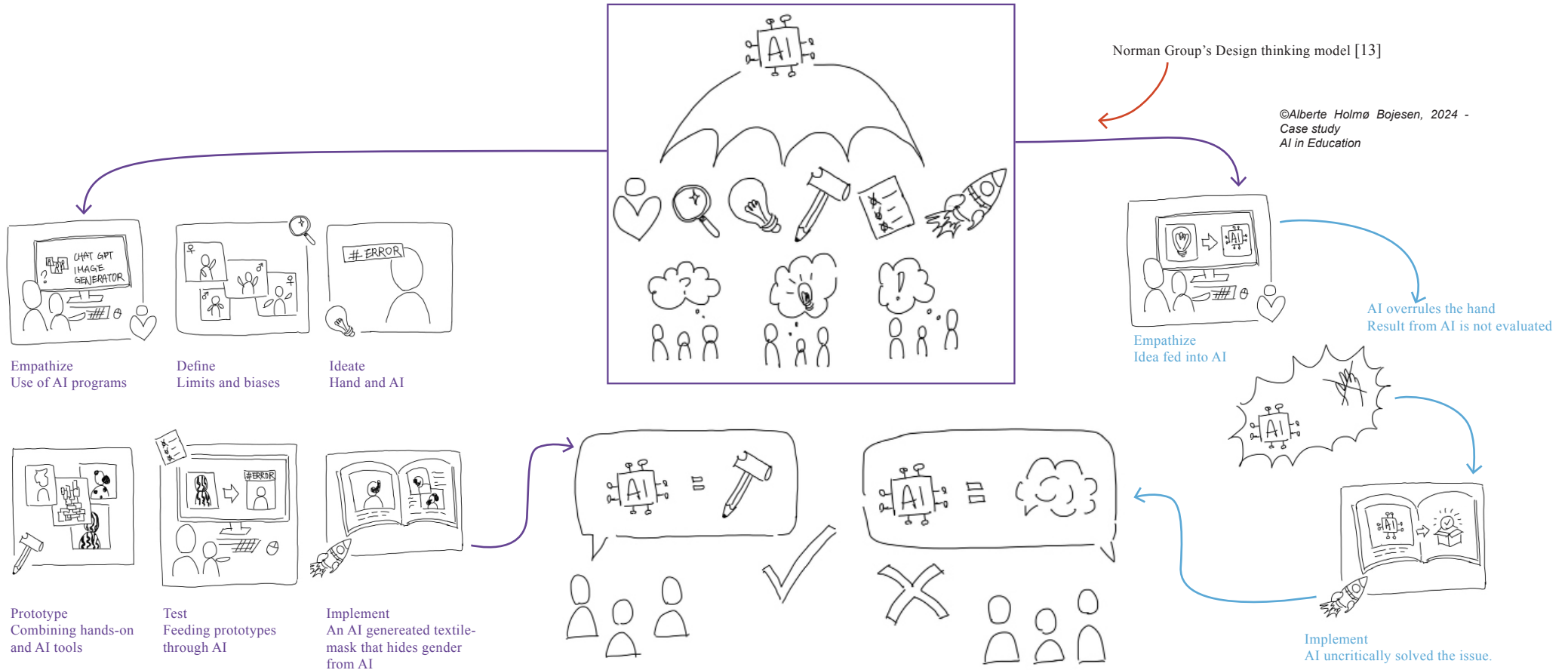


Most steps when using AI still require human validation for feasibility.

4. IMPLEMENTING MEANINGFUL AI TOOLS IN DESIGN EDUCATION

4.1 What effective role can AI have in a design process?

In accordance with the 6-step design thinking model, a workshop was conducted with 19-30 year-old design-students. They had to establish a studio addressing ‘How do we as creatives approach the emergence of AI in our design practice?’



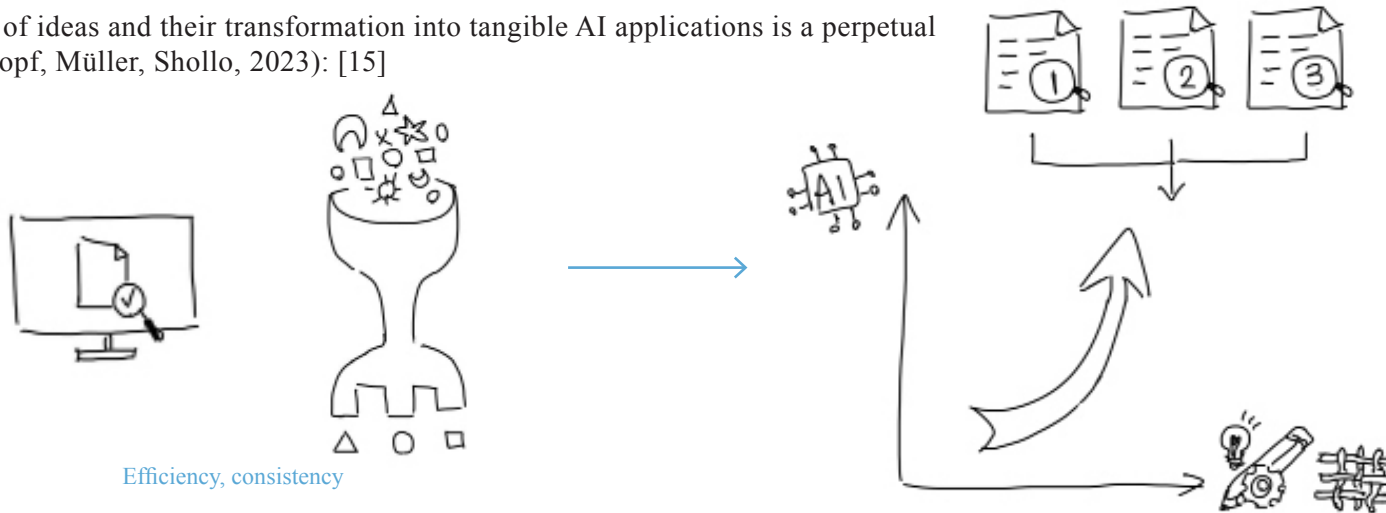
Just as any other tool AI cannot stand by itself. If the task is not specific, it is harder to shuffle in between the digital and analogue: AI's presence becomes redundant. The examples shows that to work dynamically with AI one needs to be critical towards it's solutions, to develop the design process. Otherwise it is easy to let it solve the issue, leaving out any analysis and reflection, a vital part of learning to design better: "it is only through the unity of mind and body that craftsmanship and artistic work can be fully realised"(Pallasmaa, 2009). [14]

5 BALANCING EMBODIED EXPERIENCES IN DESIGN: HANDS ON WITH AI

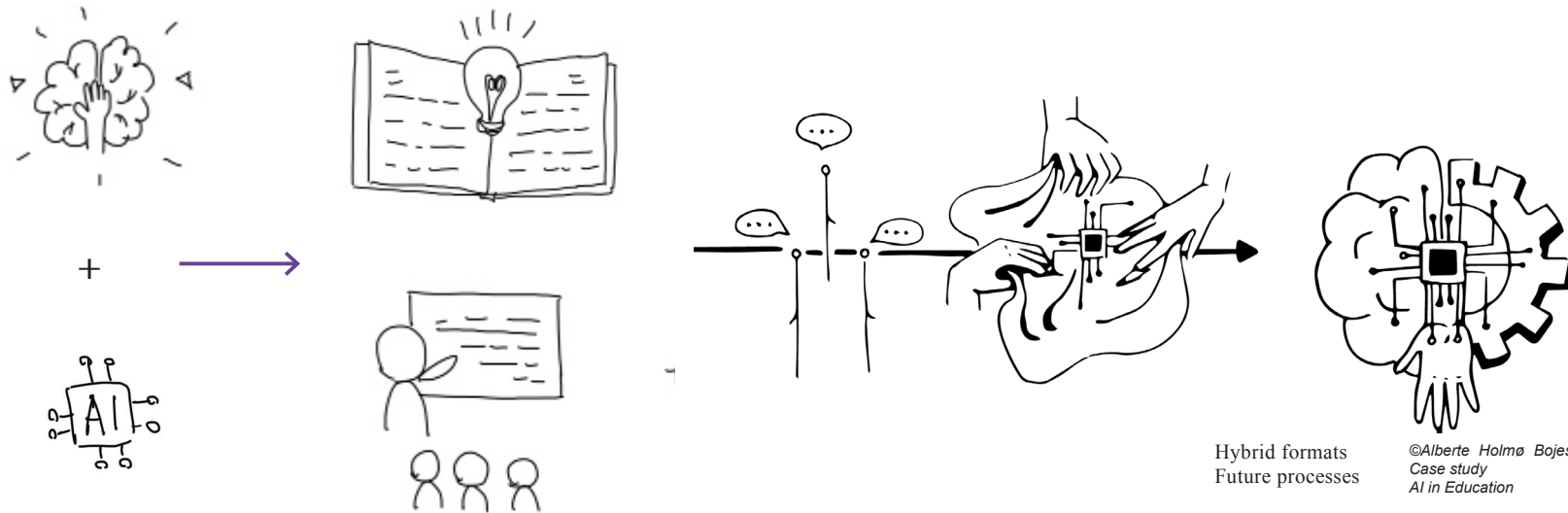
5.1 Hands on textile design with AI - a reflection

Result I:

a) The conception of ideas and their transformation into tangible AI applications is a perpetual learning curve, (Hopf, Müller, Shollo, 2023): [15]



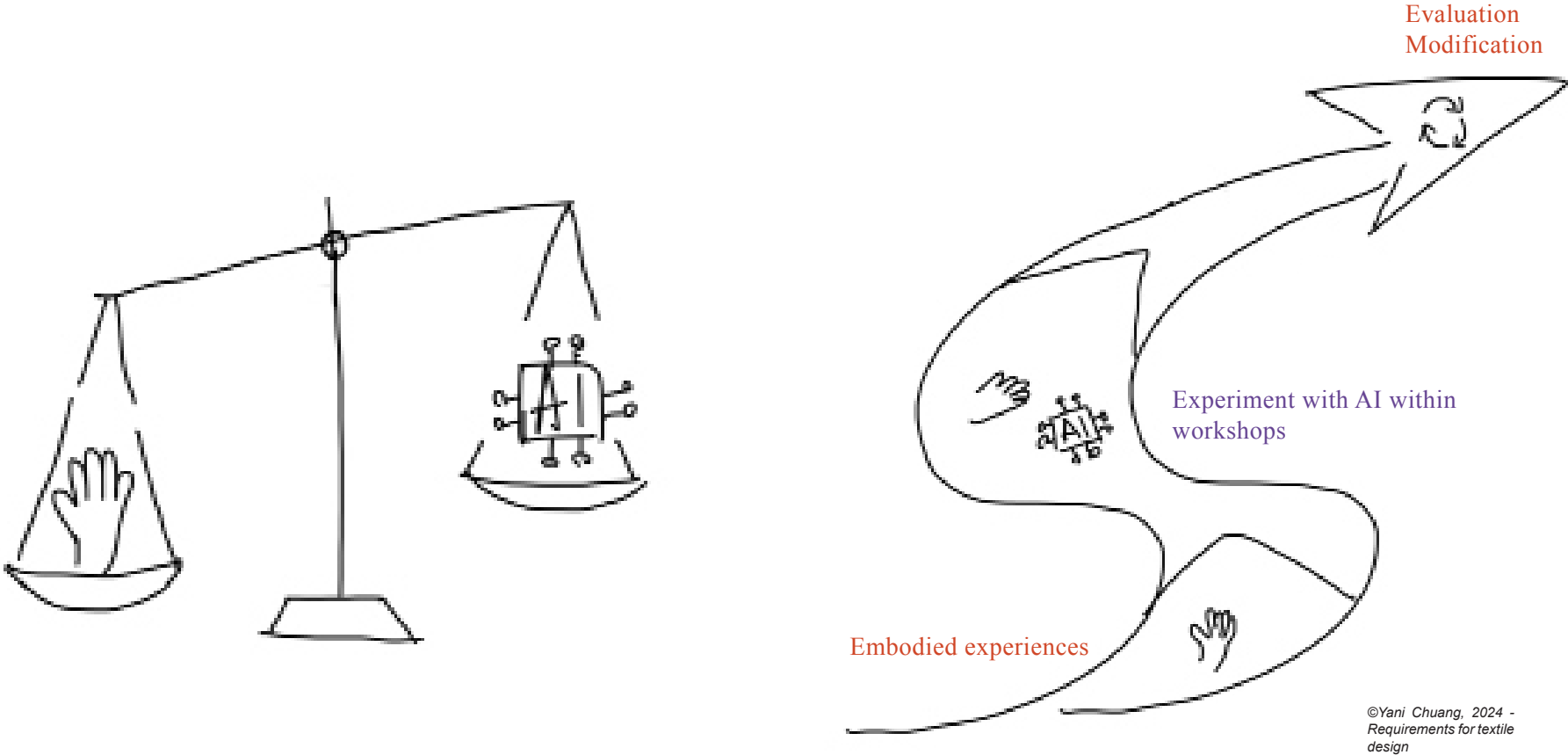
b) The following process has to be trained early on, starting with pupils but also students and PhDs:



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Case study
AI in Education

5.2 Requirements for textile design combining human and automation

Result II: Our case studies showed ‘possible scoping scenarios’ for human controlled AI textile creation demonstrated by this ‘path of textile design - AI cooperation’ that should be evaluated constantly (Hall, 2022) [16], based on embodied (textile design) experiences by humans.



To be able to ‘bridge the gap between tangible experiences and virtual ideating spaces’ (Wachs, Scholl, D’Aleo, 2022, ibid Wachs, Hall, 2019) [17], it becomes clear that interdisciplinary and interactive workshops (see: Holmø Bojesen; ibid Niesen, K. 2022) [18] are building instruments to prove innovative ways of meaningful creation.

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