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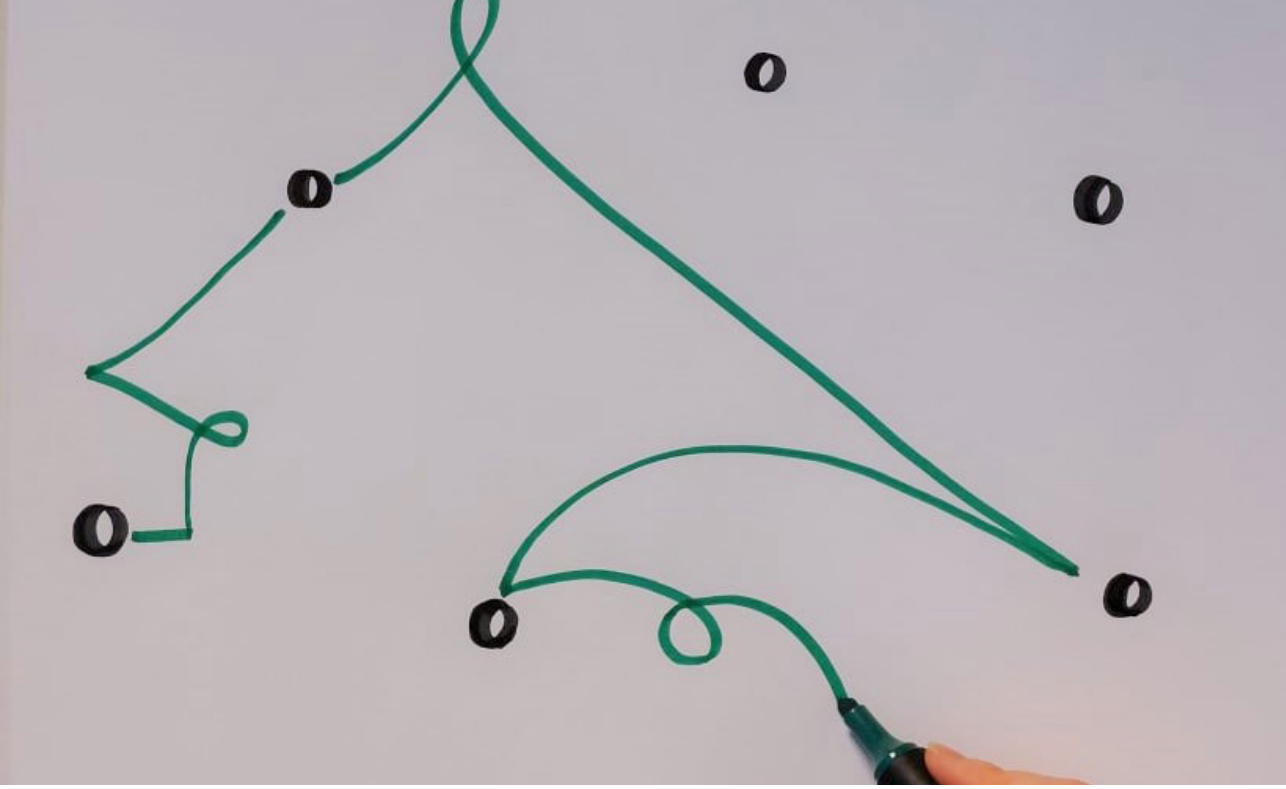

DRAWING CONNECTIONS

– AN EXPLORATION OF GRAPHIC AND VISUAL FACILITATION IN ORGANISATIONAL AND HIGHER EDUCATIONAL CONTEXTS

BY
HEIDI HAUTOPP

DISSERTATION SUBMITTED 2022

AALBORG UNIVERSITY
DENMARK

Drawing Connections

- **An Exploration of Graphic and Visual Facilitation in Organisational and Higher Educational Contexts**

By Heidi Hautopp

AALBORG
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Curriculum Vitae of the Author

Heidi Hautopp received her master's in IT, Learning and Organisational Change Management from Aalborg University, Copenhagen, in 2014. Shortly thereafter, she started working as a research assistant at Research Lab: IT and Learning Design in the Department of Culture and Learning. With a Bachelor of Education, Heidi has a profound interest in teaching and educational development. In 2018 she embarked on this four-year PhD project exploring the use of graphic and visual facilitation in organisational and higher educational contexts. She has published on topics such as 'graphic facilitation', 'visual facilitation', 'design sketching', 'educational designs', 'games', 'play', 'pragmatic inquiry' and 'creative methods' in international journals and conference proceedings.

Over the past 7 years, Heidi has taught and supervised bachelor's and master's students at Aalborg University. She has disseminated findings from her PhD research for both academic peers and visual practitioners. Furthermore, Heidi is co-founder and board member of the Danish Play Think Tank, which focuses on encouraging playful approaches in organisational and educational contexts.

Photo credit: Suezanna Zenani

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A SPECIAL DEDICATION TO MY WONDERFUL NIECE LEA

MAY YOU ALWAYS DARE TO DRAW YOUR WORLD

English Summary

Graphic facilitation is often used to describe what professional facilitators do when visually guiding group processes. The method has developed since 1970s and was initially inspired by the ways in which designers and architects use visualisations and sketching in their work practices. Globally, graphic facilitation is a growing practice with a variety of rich practitioner guides and hands-on books, but there is a lack of empirical research in the field. Thus, this research project sets out to investigate the growing international practice in organisational contexts with the aim of drawing connections to the higher educational context, especially focusing on the humanities. Based on a Design-based research approach (DBR), the PhD project commences by investigating the organisational context of graphic facilitation and the manifold understanding of the practice. Through the context investigation, it became evident to encompass both 'graphic facilitation' and 'visual facilitation' as terms to capture the current movements in the field. Through the literature review and state of the art, the field of graphic and visual facilitation is identified as being 'on the move'. Thus, this research project has aimed to build a theoretical groundwork derived from practice-based analysis to strengthen the empirical research within the field.

Recent books from the practice field encourage facilitators to get a marker in participants' hands to involve them as active drawers in the ideation and dialogue processes. However, there is a lack of empirical research on the teaching of graphic facilitation to employees seen as *active drawers*, not just at current and solitary meetings organised by an external graphic facilitator, but in long-term perspectives where we follow the participants from participating in basic graphic facilitation courses to actively implementing graphic facilitation practices in their daily work.

As such the research is guided by the following research question: How is graphic and visual facilitation being practised and how can graphic and visual facilitation support design exploration in higher education?

As this research project aimed to draw connections from the organisational context to a higher educational context, there was a focus on learning processes and teaching processes from the participants' perspectives, such as the teachers, employees and students' perspectives. I engaged in pragmatic inquiry processes with the purpose of both understanding and developing practices. I approach the research through teaching observations of basic graphic facilitation courses and follow up interviews with teachers and participants from the courses, focusing on the long-term perspectives on the use of graphic and visual facilitation in organisational contexts. Furthermore, I have experimented with different application of graphic and visual facilitation in higher educational context placing students as *active drawers* facilitating their design explorations developing designs targeting different groups.

From an organisational perspective, the research project identified the graphic and visual facilitation practice in relation to the material and visual turn in society and discussing the relation to the current meeting culture in organisations. From a higher educational perspective, connections to Problem-based learning activities are drawn and discussed in relation to current tendencies of organising teaching that foster creativity, critical inquiry and spaces of resonance. Through a context investigation and design exploration, I identified the similarities and differences between the architect and design

field and graphic and visual facilitation field. Based on this inquiry, I propose the assumption that graphic and visual facilitation is a relevant method, when humanities students develop e.g., learning and communication designs targeting different groups. Thus, the act of drawing is collaborative and process-oriented, concerned with the discussion of concepts in groups, rather than product oriented, i.e., focused on the development of a specific product. Despite the distinctions between the drawing practices in the two fields, this research project also built on the similarities to the theoretical background in design sketching to strengthen the understanding and relation to the source of inspiration back 1970s.

During my investigation of graphic and visual facilitators in their role as teachers at basic graphic facilitation courses, I identified a teaching dilemma described as 'I want to draw – I cannot draw'. The teaching dilemma describes how participants in graphic facilitation courses feel enthusiastic about acquiring new skills in visual methods but at the same time are hesitant and lack self-confidence in their own drawing skills. This research project provides knowledge about, how the teachers tackled participants' anxiety in order to create a positive and safe learning environment. The use of humour and visual metaphors was identified as a crucial part of building social memories at the courses. Furthermore, the research identifies the teachers' important role of initiating, acknowledging, and supporting the use of humour in the teaching situations. Likewise, the didactical consideration of 'drawing ugly' was identified as a way for the teachers to support a playful, explorative and positive learning environment. Following employees over a period of two years after completing a basic course in graphic facilitation showed how the employees continued working with the method, where they had evolved and expanded their repertoire. Furthermore, the findings showed that the drawing practices allowed the employees to show and use various parts of their academic competences, such as creative, humorous, and informal aspects in their professional lives, which has altered their way of preparing and facilitating meetings.

Simultaneously with the investigation of the organisational context – building on findings from here - I was conducting design experiments and conducting retrospective analysis of the iterative development of the educational designs. Here, I explored the combination of graphic and visual facilitation and design sketching, and iterations where the combination was further explored in relation to including other methods such as visual ethnography and animation-based sketching. In each of the three design experiments presented in the papers (Papers 4-6), the students were encouraged to take the role of game designers, digital learning designers or communication designers. Thus, all student groups were tasked to initiate critical inquiry when designing social interactions for others to engage with, e.g., developing games for change. The research contributes with an explicit focus on *the two-fold function of DBR* to support the students' design exploration in higher education. Thus, it shows the importance of DBR as an iterative research frame for the ongoing development of the design experiments and as a teaching frame, in which students were prompted to take the role as designers entering design exploration in a specific context.

The results of the design experiments provide insights into the use of *drawing as an academic dialogue tool* in higher education, placing an emphasis on the teachers' position as a role model in both introducing drawing techniques and supporting the students use of visual materials in both their design exploration during courses and in their final exams. Thus, the research project investigates the importance of *creating spaces of joint inquiry* for students to engage in the different use of visuals in their design processes.

Even though the students were explicitly encouraged to reflect theoretically on their work through visuals and to incorporate these visuals into their final exams, the findings show that some students perceived the methods as practical tools and were doubtful whether to include the materials in the dialogue in the exam situation. Thus, the research project points to a continuous need for students to acquire a variety of concepts so that they can discuss and acknowledge these ways of working in higher education. Furthermore, the research project address the teachers' roles as importing for developing a language to address the value of visual inquiry approaches, so we can support students' theoretical meta-reflections on their pragmatic design processes.

As the research object in this PhD project was a visual methods, I have also explored different visual approaches to research such as:

1. Exploration of drawings as a means of doing visual research
2. Exploration of drawings as a means of developing educational designs
3. Exploration of drawings as a means of presenting research

By a visual review of these approaches presented in the dissertation, this research project contributes with an example on how higher educational teachers can engage in design processes. Thus, this research project joins the ongoing dialogues aimed at understanding education as designs for learning. By the rich and visual descriptions of PBL activities, student work and reflective evaluations in each design experiment the research project can function as inspiration for applying similar approaches to new local contexts in higher education. Based on the results of the research project, I end this dissertation by suggesting "The Drawing Connections Model", that acknowledge the multimodal, creative, and critical inquiry approaches in academic practice. The purpose is to provide a language for illuminating and describing design exploration and design decisions in academia, which often relies on negotiating reality through different materials rather than making decisions based on rationality and logical thinking alone.

Dansk resume

Grafisk facilitering anvendes ofte til at beskrive, hvad professionelle facilitatorer gør, når de guider gruppeprocesser visuelt. Udbredelsen af metoden startede i 1970'erne og var oprindeligt inspireret af den måde, designere og arkitekter anvender visualiseringer og skitseringer i deres arbejde. Globalt set er grafisk facilitering et voksende felt, hvor der findes mange righoldige praksisbaserede publiceringer og håndbøger, men der mangler empirisk forskning på området. Dette forskningsprojekt har til formål at undersøge den voksende internationale praksis i organisatoriske sammenhænge med det formål at tegne forbindelser til den videregående uddannelseskontekst med særligt fokus på humanistiske uddannelser på universitetet. Med udgangspunkt i en Design-based research (DBR) tilgang undersøger ph.d.-projektet den organisatoriske kontekst for anvendelse af grafisk facilitering og derigennem den mangfoldige forståelse af praksis. Gennem kontekstundersøgelsen blev det tydeligt, at det var relevant både at inkludere 'grafisk facilitering' og 'visuel facilitering' som definitioner for at undersøge de aktuelle bevægelser inden for feltet. Gennem litteratur review og state of the art undersøgelse, har jeg identificeret grafisk og visuel facilitering som værende et praksisfelt i hastig udvikling. Dermed har dette forskningsprojekt haft til formål at underbygge et teoretisk grundlag udledt af praksisbaseret analyser for at styrke den empiriske forskning inden for feltet.

I nyere publiceringer fra praksisfeltet, opfordres facilitatorer til at give deltagerne på møderne en pen i hånden for at inddrage dem som aktive tegnere i idé- og dialogprocesserne. Der mangler dog empirisk forskning omkring undervisning i grafisk facilitering, hvor medarbejdere anses som aktive tegnere i processerne, ikke kun ved enkeltstående møder arrangeret af en ekstern grafisk facilitator, men ud fra mere langsigtede perspektiver, hvor medarbejderne følges fra deres deltagelse i grafisk basis faciliteringskurser til, at de aktivt implementerer metoden i deres eget daglige arbejde.

Dermed er dette forskningsprojekt styret af følgende forskningsspørgsmål: Hvordan praktiseres grafisk og visuel facilitering, og hvordan kan grafisk og visuel facilitering understøtte designudforskning på videregående uddannelser?

Da forskningsprojektet har til formål at tegne forbindelser fra den organisatoriske kontekst til en videregående uddannelseskontekst, er der fokus på læreprocesser og undervisningsprocesser set fra et deltagerperspektiv, herunder perspektiver fra både undervisere, medarbejdere og studerende. Igennem en pragmatisk tilgang til undersøgelsen har jeg haft en hensigt om både at forstå og udvikle praksis. Gennem observationer af basiskurser i grafisk facilitering samt opfølgende interviews med både undervisere og deltagere fra kurserne, har undersøgelsen bidraget med indsigt i de langsigtede perspektiver for anvendelsen af grafisk og visuel facilitering i organisatoriske sammenhænge. Gennem designeksperimenter på videregående uddannelser, har jeg eksperimenteret med forskellige anvendelsesmuligheder af grafisk og visuel facilitering i denne kontekst. Her blev undervisningen designet med fokus på studerende som *aktive tegnere*, der anvender de visuelle metoder til at facilitere deres egen designudforskning rettet mod udvikling af design til forskellige grupper.

Ud fra et organisatorisk perspektiv identificerede forskningsprojektet relationen mellem den grafiske og visuelle faciliteringspraksis og det aktuelle fokus på materialitet og visualiseringer i samfundet samt diskuterede relationen til den historiske udvikling af mødekultur i organisationer. Ud fra et

videregående uddannelsesperspektiv, blev der tegnet og diskuteret forbindelser til problembaserede læringsaktiviteter (PBL) i relation til aktuelle tendenser om at organisere undervisning, der fremmer kreativitet, kritisk undersøgelse og resonansrum. Gennem en kontekstundersøgelse og udforskning identificerede jeg lighederne og forskellene mellem arkitekt- og designfeltet og det grafiske og visuelle faciliteringsfelt. På baggrund af denne undersøgelse, antager jeg, at grafisk og visuel facilitering er en relevant metode at introducere på universitetet, når humanistiske studerende udvikler f.eks. lærings- og kommunikationsdesign rettet mod forskellige grupper. Her anses tegneaktiviteten som kollaborativ og procesorienteret, og anvendes med henblik på diskussion af konceptideer i grupper, snarere end et produktorienteret fokus i relation til udviklingen af et specifikt produkt. På trods af forskellene mellem tegnepraksisserne inden for de to felter, baserer dette forskningsprojekt sig også lighederne i forhold til den teoretiske baggrund inden for designfeltet. Hermed bidrager forskningsprojektet med at styrke og forankre det teoretiske fundament mellem grafisk og visuel faciliteringspraksis og arkitekt og designfeltet.

Gennem min undersøgelse af grafiske og visuelle facilitatorer i deres rolle som undervisere på grafisk basis faciliteringskurser, identificerede jeg et undervisningsdilemma beskrevet som 'Jeg vil tegne - jeg kan ikke tegne'. Undervisningsdilemmaet beskriver, hvordan deltagere på grafiske faciliteringskurser både er begejstrede for at tilegne sig nye færdigheder i de visuelle metoder, men samtidig er tøvende og mangler selvtillid i forhold til deres egne tegnefærdigheder. Dette forskningsprojekt bidrager med viden om, hvordan undervisere tacklede deltagernes angst ved at skabe et positivt og trygt læringsmiljø. Anvendelsen af humor og visuelle metaforer blev identificeret som værende af afgørende betydning for opbygning af sociale minder på kurserne. Endvidere identificererede jeg, at underviserne havde en vigtig rolle i forhold til at igangsætte, anerkende og understøtte brugen af humor i undervisningen. Ligeledes blev en didaktisk overvejelse fra undervisernes side om at 'tegne grimt' identificeret som en måde at understøtte et legende, eksperimenterende og positivt læringsmiljø. Studiet hvor medarbejdere blev fulgt i en periode på to år efter gennemført basiskursus, viste hvordan medarbejderne stadig arbejdede med grafisk og visuel facilitering som en del af deres arbejdspraksis, hvor de havde udviklet og udvidet deres repertoire løbende. Resultaterne bidrager med en indsigt i medarbejdernes oplevelser af, at brugen af de visuelle metoder havde givet dem mulighed for at vise andre sider af deres akademiske kompetencer såsom kreative, humanistiske og uformelle aspekter i deres professionelle liv, hvilket også havde ændret den måde, de forberedte og faciliterede møder på.

Samtidig med undersøgelsen af den organisatoriske kontekst – med udgangspunkt i fund herfra – gennemførte jeg designeksperimenter samt retrospektive analyser af den iterative udvikling af de didaktiske designs i en videregående uddannelseskontekst. Her udforskede jeg kombinationen af grafisk og visuel facilitering og design sketching og også iterationer, hvor denne kombination blev udforsket i relation til fx visuel etnografi og animationsbaseret sketching. I hvert af de tre designeksperimenter præsenteret i artiklerne (artikel 1-3) blev de studerende opfordret til at påtage sig rollen som spildesignere, digital læringsdesignere eller kommunikationsdesignere. Alle de studerende fik således til opgave at igangsætte kritiske design udforskninger, når de skulle designe sociale interaktioner, som andre kunne engagere sig i, f.eks. når de udviklede spil med sociale formål. Forskningsprojektet bidrager med et eksplicit fokus på DBR's dobbelte funktion i forhold til at understøtte de studerendes designudforskning på de videregående uddannelser. Det viser således betydningen af DBR som en iterativ forskningsramme for den løbende udvikling af designeksperimenterne og som en iterativ undervisningsramme, hvor de studerende blev opfordret til at påtage sig rollen som designere som del af deres designundersøgelser i en specifik kontekst.

Resultaterne af designeksperimenterne giver indsigt i brug af *tegning som et akademisk dialogværktøj* på de videregående uddannelser, hvor der lægges vægt på underviserens *ageren som rollemodel* i forhold til både at introducere tegneteknikker og understøtte de studerendes brug af visuelle materialer som del af deres designudforskning både under kurserne og i deres afsluttende eksamener. Forskningsprojektet undersøger således vigtigheden af at *skabe rum for fælles eksperimentering*, hvor de studerende på forskellige måder kan engagere sig anvendelsen af visuelle metoder og materialer i deres designprocesser.

Selvom de studerende eksplicit blev opfordret til at reflektere teoretisk over deres visuelle design eksperimenter og til at inddrage disse materialer i deres afsluttende eksamener, viser forskningsprojektet, at nogle studerende overvejende opfattede de visuelle metoder som praktiske værktøjer og var i tvivl om, hvorvidt de skulle inddrage materialerne i eksamensdialogerne. Forskningsprojektet peger således på et fortsat behov for, at de studerende tilegner sig en række forskellige begreber, så de kan diskutere og anerkende arbejdet med de visuelle metoder på de videregående uddannelser. Forskningsprojektet understreger desuden undervisernes vigtige rolle i relation til at understøtte udviklingen af et akademisk sprog til at adressere værdien af visuelle undersøgelsestilgange, så vi kan understøtte studerendes teoretiske meta-refleksioner over deres pragmatiske designprocesser.

Da forskningsobjektet i ph.d.-projektet omhandlede en visuel metode, så har jeg gennem undersøgelsen også udforsket forskellige visuelle tilgange til forskning såsom:

1. Udforskning af tegninger som en metode til at praktisere visuel forskning
2. Udforskning af tegninger som en metode til at udvikle didaktiske designs
3. Udforskning af tegninger som en metode til at at præsentere forskning

Baseret på en visuel gennemgang af disse tilgange, bidrager dette forskningsprojekt med et eksempel på, hvordan undervisere på videregående uddannelser kan engagere sig i designprocesser. Dette forskningsprojekt bidrager således til den løbendes diskurs inden for uddannelsesforskning, der sigter mod at forstå uddannelse som 'designs for læring'. Gennem de rige og visuelle beskrivelser af PBL-aktiviteter, samt studerendes arbejde og de reflekterende evalueringer efter hvert designeksperiment kan resultaterne fra forskningsprojektet fungere som inspiration til at anvende lignende tilgange i andre lokale kontekster på videregående uddannelser. På baggrund af resultaterne af forskningsprojektet, afslutter afhandlingen med at foreslå "At tegne forbindelser modellen" (The Drawing Connections Model), der anerkender de multimodale, kreative og kritiske undersøgelsestilgange i akademisk praksis. Formålet er at give et sprog til at belyse og beskrive designudforskning og valg af designbeslutninger i den akademiske verden, som ofte er afhængig af at forhandle virkeligheden gennem forskellige materialer frem for at træffe beslutninger baseret på rationalitet og logisk tænkning alene.

Table of Contents

Chapter 1: Introduction 1
1.1. Connecting academic disciplines in higher education 2
1.2. A traveller going into the field: graphic and visual facilitation 3
1.3. "I want to draw – I cannot draw" – the dilemma in teaching graphic facilitation 3
1.4. Starting point of the PhD project 5
1.5. Research question 6
1.8. Why this title for the PhD project? 7
Chapter 2: Drawing as a research object 13
2.1. The visual display – basic elements 13
2.2. The roles in graphic and visual facilitation – facilitator and participants 15
2.3. The interplay – process over product 16
2.4. Digital possibilities in graphic and visual facilitation 19
2.5. Expanding the field – graphic and visual facilitation 23
2.6. Summary 25
Chapter 3: Research design 27
3.1. The use of theory to reflect and validate personal experiences 27
3.2. The connection between academic drawing and academic writing 28
3.3. Arts-based research as a pragmatic approach to inquiry 30
3.4. Design-Based Research 31
3.4.1. Central aspects in DBR projects 31
3.4.2. The structure of the DBR phases in the research project 34
3.4.3. The twofold function of the Design-Based Research 41
Chapter 4: Context description and empirical foundation 43
4.1. Elaboration of the organisational context 43
4.2. Elaboration of the higher education context 48
4.3. Selection of primary empirical foundation 56
Chapter 5: Drawing as a research approach 59
5.1 Exploration of drawings as a means of doing visual research 59
5.2 Exploration of drawings as a means of developing educational designs 61
5.3. Exploration of drawings as a means of presenting research 74

Chapter 6: Theoretical perspectives ... 77
6.1. Learning perspectives ... 77
6.2. Design perspectives ... 80
6.3. Abductive analysis – connecting theory and practice ... 81
Chapter 7: Presentation of Papers ... 83
Paper 1: A Review of Graphic Facilitation in Organizational and Educational Contexts ... 85
Paper 2: The Lazy Netflix B – an Ethnographic Study on the use of Humour and Visual Metaphors in teaching graphic facilitation ... 97
Paper 3: From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees ... 99
Paper 4: Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study ... 101
Paper 5: Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education ... 117
Paper 6: The process from teaching to assessing students' designerly and creative ways of working in higher education ... 135
Chapter 8: Adventure of thought ... 155
8.1. The Drawing Connection Model ... 162
Chapter 9: Conclusion - connecting the lines ... 165
9.1. How is graphic and visual facilitation being practised? ... 165
9.2. How can graphic and visual facilitation support students' design exploration in higher education? 168
9.3. Methodological contribution ... 171
References ... 173
Appendix overview ... 189

Table of Figures

Figure 1: A visual illustration of the conversation between me and Nathalia Ilyin's (2019) work 5
Figure 2: A visualisation of the title of the PhD project 7
Figure 3: The visual metaphor 'The dialogue around a design table' 8
Figure 4: Manifold of definitions in the field of graphic and visual facilitation – fieldwork at EuViz 2018 9
Figure 5: Google Ngram Viewer result for 'Graphic facilitation and Visual facilitation' 10
Figure 6: The Group Graphics® Keyboard, Figure 2, Sibbet, 2008, p. 121 14
Figure 7: Screenshots from the Bigger Picture videos on visual facilitation 15
Figure 8: A visual illustration of a graphic and visual facilitation context 15
Figure 9: A visual illustration of a graphic facilitation teaching session 16
Figure 10: My drawing of a cup – fieldwork at Copenhagen Art School 18
Figure 11: Participant's drawing of herself reflecting on her approach 20
Figure 12: Participants' drawing on main insights from the workshop day 21
Figure 13: Visual overview of the publication from Danish authors within the field 24
Figure 14: A pink dinosaur visiting the EuViz Conference, 2018 30
Figure 15: Design-based research phases – my own visualisation inspired by ELYK innovation model 34
Figure 16: Visual presentation of the relation between fieldwork (left) 37
Figure 17: A one-on-one experiment regarding the use of a document camera conducted 39
Figure 18: Visual presentation of the twofold function of Design-Based Research 41
Figure 19: Overview of the contexts of the different design experiments 51
Figure 20: Video sketching framework, figure 1, Ørngreen et al., 2017, p. 423 53
Figure 21: A visual note from my participatory observations at a basic graphic facilitation course 60
Figure 22: Two drawings shared by a participant in the interview on long-term perspectives 61
Figure 23: Introduction slide to most of my teaching in graphic facilitation 63
Figure 24: Presentation drawing from workshop in graphic facilitation – 64
Figure 25: Examples of imaginative development of doodles 64
Figure 26: Example of presentation drawing of a teaching plan (2015) 65
Figure 27: An invitation for students to draw at the university 66
Figure 28: Examples of variations of the star person 67
Figure 29: Students' development of their own visual vocabulary 68
Figure 30: Drawing by Mie Nørgaard illustrating a conflict management situation (2016) 69
Figure 31: A student group's drawing of a conflict situation inspired by Nørgaard's drawing 69
Figure 32: Drawing from an ethnographic fieldwork at Medical Museion, 2020 70
Figure 33: A neat presentation of my observations at a museum – context investigation 71
Figure 34: Rough sketch and a presentation drawing of my observation (2021) 72
Figure 35: Overview of adjustments and redesigns in the third design experiment (Paper 6) 73
Figure 36: My initial sketch drawing of the Lazy Netflix B – fieldwork 2018 74
Figure 37: Presentation drawing of the Lazy Netflix B 75
Figure 38: A visual presentation of the roles of a graphic facilitator (Paper 3) 76
Figure 39: Overview of the papers and how they relate to the research questions 83
Figure 40: Fieldnote of the connection between visual facilitation and dancing 155
Figure 41: Fieldnote of writing exercise - from autoethnographic PhD course 1/3 156
Figure 42: Fieldnote of writing exercise - from autoethnography PhD course 2/3 157

Figure 43: Fieldnote of writing exercise - from autoethnographic PhD course 3/3 157
Figure 44: Fieldnote from the EuViz conference 2018..... 158
Figure 45: Field note from the autoetnographic PhD course –..... 159
Figure 46: The Drawing Connections Model 163
Figure 47: Model illustrating students' utilization of visual materials in the exam situation (Paper 6) 170

Preface

This dissertation is based on the results of a four-year-long PhD study at the Department of Culture and Learning at Aalborg University, Copenhagen in association with the Research Lab, IT and Learning Design. Besides conducting the research project, I also worked as a lecturer for 25 percent of the job position during the four years. The dissertation consists of six original papers and a framing text with an introduction, research questions, research design and summary of contributions.

The following original papers are included in the dissertation:

- Paper 1: Hautopp, H., and Ørngreen, R. (2018). A Review of Graphic Facilitation in Organizational and Educational Contexts. *Designs for Learning*, *10*(1), 53–62. DOI: http://doi.org/10.16993/dfl.97 (published).
- Paper 2: Hautopp, H. (2022). The Lazy Netflix B: An Ethnographic Study on the Use of Humour and Visual Metaphors in Teaching Graphic Facilitation (under 2nd round of review by *Journal of Designs for Learning*).
- Paper 3: Hautopp, H., and Ørngreen, R. (2022). From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees (submitted for review by *Journal of Visual Communication*).
- Paper 4: Hautopp, H., and Ejsing-Duun, S. (2020). Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study. *Electronic Journal of E-Learning*, *18*(5), pp. 373-386. https://doi.org/10.34190/JEL.18.5.001 (published).
- Hautopp, H., and Buhl, M. (2021). Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education. *Electronic Journal of E-Learning*, *19*(5), pp. 321-335. https://doi.org/10.34190/ejel.19.5.2466 (published).
- Paper 6: Hautopp, H. (2021). The process from teaching to assessing students' designerly and creative ways of working in higher education. In: *Proceedings of ICERI2021 Conference 8th-9th November 2021*, pp. 6906-6924 (published).

Reprints of the papers are included and referenced in this dissertation. Likewise, the original publications are incorporated in the layout of the dissertation, without alterations to the content or original layout. The papers are referenced as Paper 1 to Paper 6, and excerpts are referenced and used throughout this framing text. Based on two conference papers and presentations by the authors at the European Conference on E-learning, the studies in Papers 4 and 5 were selected to be elaborated into journal papers in the *Electronic Journal of E-Learning*. Thus, Papers 4 and 5 are extensive elaborated, but there will be sections that overlap with the conference proceedings (Hautopp and Ejsing-Duun, 2019; Hautopp and Buhl, 2020).

The structure: This dissertation is divided into 9 chapters: 1. Introduction, which introduces and frames the research project and research question. 2. Drawing as a research object, which introduces the research area. 3. Research design, which presents the strategy of inquiry and the design experiments conducted. 4. Context descriptions and empirical foundation, which presents the organisational and higher educational contexts of the research. 5. Drawing as a research approach, which presents drawing as a concrete and active research approach in the research project. 6. Theoretical perspectives, which presents the main theoretical perspectives within learning, design and abductive reasoning. 7. Presentation of papers, which contains the original papers and a further discussion. 8. Adventure of thought, where research results are further discussed in relation to academic practice. 9. Conclusion – connecting the lines, which discusses the contribution across papers and answers the research question.

Chapter 1: Introduction

In early childhood, we start expressing ourselves through drawings (Goldschmidt, 2003; Edwards, 1974/2012). Besides speaking, symbols, dots, lines, colours, etc. become our primary way of communicating with the world. In kindergarten and the first years of elementary school our drawing skills are cultivated and improved. But as we advance in the educational system and learn to read and write, our drawing skills become less cultivated and appreciated (Buhl and Flensborg, 2011). As youths and adults, we can even feel embarrassed by our drawing skills, judging them to be too childish (Lyon, 2020). Maybe there is a grain of truth in our own judgement, because we actually stopped drawing when we were a child. As skills are supposed to be developed and maintained to be adequate, it is no wonder that our drawing skills lack practice as they – for the majority of us – are left behind in the schoolyard.

However, some professions, such as architects and designers, have a long tradition of cultivating, developing and maintaining their drawing skills throughout their educational programs (e.g. Schön, 1983; Goldschmidt, 2003). Long hours of doing sketching form part of the educational background of architects (e.g. Hyams, 2020). Sketching is a way of getting ideas down on paper and communicating these ideas to others (Twersky and Suwa, 2009). This is kind of like the approach we had when we were children – testing our thoughts in the real world, the world we could imagine on paper.

So maybe in adulthood, we also judge our drawing skills in relation to e.g. artists, architects and designers, who arguably form the adult group who we relate the act of drawing to? However, researchers advocate that designerly ways of working have potential beyond the original fields (Hansen and Dalsgaard, 2012; Ejsing-Duun and Skovbjerg, 2019). Graphic facilitation is a method which is inspired by the way architects and designers work (Sibbet, 2001) and is a method that has been developed in organisational contexts (Sibbet, 2010; 2012). Thus, the method of graphic facilitation can be seen as derived from architectural and designerly ways of working while going beyond these original fields.

Graphic facilitation is often used to describe what professionals do when visually representing group processes (Sibbet, 2008; Tyler, Valek and Rowland, 2005). In the field of graphic facilitation, analogue drawing techniques are referred to as the typical way of doing graphic facilitation, whereby the facilitator draws on large pieces of wall-paper while involving participants. Graphic facilitation is not about depicting reality; instead, it is about representing ideas and icons in relation to other ideas illustrated in real-time on the basis of participants' contributions (Valenza and Adkins, 2009).

In his book *Visual Meetings*, founder of graphic facilitation, David Sibbet (2010), emphasises: *"If you ever felt a twinge of remorse at having to give up all that creative expression you experienced as a young child, you will be delighted to discover that not only is it reclaimable, but also it can help you access some of the most powerful meetings methods available*" (2010, introduction / xxi).

My own experiences included, it can be argued that graphic facilitation can spur our initial joy of drawing and can be a creative way of expressing ideas and communicating with others; an approach that began in early childhood and has the potential to be renewed as an academic working skill in adulthood. Many handbooks and practice-based papers have been published within this field, which has increased its popularity globally. However, there is a lack of research in the field (Nielsen et al., 2016; Hautopp and Ørngreen, 2018). This research project aims to investigate the method of graphic

facilitation in organisational contexts and explore the potentials of teaching this method in higher education, especially within the humanities, challenging this area which traditionally relies upon oral and written language (e.g. Mirzoeff, 2000; Bowen and Edwards, 2015).

1.1. Connecting academic disciplines in higher education

In this section, I will outline a connection between the design and architecture field and the humanities as a stepping stone for further exploration. When placing graphic facilitation in relation to the architecture and design field, it becomes relevant to discuss the relational connections based on previous work by others. Thus, I draw on the work of architect and educational researcher, Donald Schön (1983), who argues that since the 1960s the concept of design has broadened from what he terms the 'mother' in the family of design professions (Schön, 1983, pp. 76-77). Schön elaborates how the field of architecture has been constricted by the emergence of newer professions such as planning, construction engineering and landscape design. Likewise, he further argues that all professions could benefit from thinking like a designer, where reflective practices are privileged over technical rationality. Schön elaborates how a designer works: **"***He shapes the situation, in accordance with his initial appreciation of it, the situation 'talks back' and he responds to the situation's back-talk. In a good process of design, this conversation with the situation is reflective. In answer to the situation's back-talk, the designer reflects-in-action on the construction of the problem, the strategies of action, or the model of phenomena, which have been implicit in his moves."* (Schön, 1983, p. 79). Schön is inspired by Dewey's understanding of inquiry processes, where consequences of actions are reflected based on an ongoing dialogue – back-talk – with the surroundings. Other researchers within the architectural field have elaborated on Schön's perspectives (e.g. Goldschmidt, 2003; Twersky and Suwa, 2009) and these perspectives will be elaborated in Chapter 5. *Drawing as a research approach* and in Chapter 6. *Theoretical perspectives*.

Here I will mention Christopher Frayling's "Research in Art and Design" (1993) where he points to the connection between doing design and doing research addressing a tendency where research has become a word to be associated with what artists, craftspeople and designers do all the time (Frayling, 1993, p. 1). In line with Frayling's statements, Cross et al. (2006) argue for a current tendency within the design field, where there is explorations of the implications of 'design' being a part of everyone's education, in the same ways that the sciences and the humanities are parts of everyone's education (Cross et al., 2006). Cross et al. argue that 'designerly ways of knowing' – the underlying pattern of how designers think and act – has value for everyone across disciplines to study (Cross et al., 2006, preface). Based on the abovementioned sources within the architecture and design field, I argue that 'designerly ways of knowing' are relevant beyond the architecture and design fields. As mentioned in the introduction, researchers from other fields argue the same (Dalsgaard and Hansen, 2012; Ejsing-Duun and Skovbjerg, 2019). Hansen and Dalsgaard argue that design is entering new domains and that "*one way for us to be able to act as designers in new domains is to adapt existing methods. In turn, this requires the ability to reflect on why and how these methods work*" (Dalsgaard and Hansen, 2012, p. 666). From this perspective, graphic facilitation can be characterized as a method that combines verbal and visual language (Nielsen et al., 2016), which might be a way of adapting design methods to new domains such as the humanities, where students are developing e.g. learning and communication designs. However, when I try to draw connections between the architecture and design field and the humanities, it is also relevant to outline some differences. I will do this in Chapter 2. *Drawing as a research object* and in Chapter 4 regarding the context description of humanities in higher education.

1.2. A traveller going into the field: graphic and visual facilitation

When we start a research project, we embark on a personal journey (Creswell, 2012, p. 1). Thus, I consider my research approach as a traveller going into the field of graphic and visual facilitation. From a pragmatic perspective, this personal journey can be viewed as an inquiry process similar to how we process our everyday life experiences (Dewey, 1922; Brinkmann, 2012). In this perspective, I consider that my research in graphic facilitation started years before the actual date of the PhD project start in February 2018. As a child, I liked to draw and write with different fonts on the blackboard in the classroom. I remember having fun with my friends in the breaks and we usually did not wipe the board before lectures, just to see if the teachers would comment on our creations. I had a Danish teacher who was also my sports, art, music, religion and history teacher and she had a way of implementing all the disciplines through exciting projects and roleplays, etc. In a retrospective view, it is clear she worked in a very cross-disciplinary way, an approach which has had a huge influence on how I view academic disciplines today, seeking connections and ways to break expectations of 'how might we' work on a particular subject.

When I first stumbled across graphic facilitation back in 2015 on the course "Visual Communication at your workplace" held by PhD and facilitator, Mie Nørgaard (author of, among others, the handbook *Professional Visual Facilitation*, 2021), I was reminded of my own joyful drawing and writing on the blackboard in the classroom. The aim of the graphic facilitation course was for us participants to acquire basic drawing skills in order to implement these in our daily work. At the time, I had just started working as a research assistant at the Research Lab; IT and Learning Design Lab, Aalborg University, Copenhagen and I began to wonder how I could implement these ways of working there. I proposed a workshop for my colleagues in the Lab in autumn 2015. This led to invitations to teach students in the method and from this point, I started investigating the potentials and barriers of the graphic facilitation method in academic contexts through different teaching experiments.

After my encounter with Mie Nørgaard, we also worked together on a paper based on her experiences as a graphic facilitator working in organizations (Hautopp and Nørgaard, 2017) as well as conducting an exploratory case study on the use of graphic facilitation in an elementary school (Hautopp, Nørgaard, Weibull and Johansen, 2017). I have also found this collaborative approach to investigating the field valuable throughout my research project in dialogue with both practitioners and colleagues at Aalborg University. Other collaborations during my PhD project will be further elaborated in Chapter 4.

1.3. "I want to draw – I cannot draw" – the dilemma in teaching graphic facilitation

As mentioned, I first became acquainted with graphic facilitation in a teaching setting in a course held by Mie Nørgaard in 2015, where I participated in alongside seven other participants who were employees at different companies. Nørgaard started the course by asking: "*Who thinks that they cannot draw*"? To my surprise, everyone raised their hand except me. Nørgaard convinced us that it was not an issue about lack of belief in our own drawing skills, because luckily everyone can learn to use graphic facilitation as a tool for visual communication at work. After discovering that I was the only one who thought as myself as someone 'who could draw', I remember my internal dialogue during the lesson and reconsiderations of my own drawing skills: "*Could I actually draw*?" Maybe not like an artist or designer, but based on my previous experiences in elementary school working in cross-disciplinary

and creative ways, I had a belief that I had the ability to draw in some way or another. However, my curiosity was sparked, because what did it mean to 'draw' as adults in a professional context? And why did the other participants consider themselves as non-drawers?

Alongside my abovementioned activities and teaching experiments at Aalborg University, I also studied publications within this field as well as participating in other graphic facilitation courses and network meetings. In 2017, I conducted a pilot study where I followed a professional graphic facilitator teaching a two-day basic graphic facilitation course to employees with different job functions in a municipality. Through teaching observations and small interviews with the participants, I discovered that participants engaged with the graphic facilitation method, but at the same time, they felt reluctant regarding the use in their own working practice after completing the course. Examples of participant's experiences were: "*It would be overwhelming for me to stand in front of my employees and draw*" and "*It would be nice to get more practice in actually **doing** graphic facilitation during presentations*". These experiences point to some insecurities regarding actually using graphic facilitation in front of others in their own practices. Another participant described: "*There is somebody who always takes the pen and just starts drawing. Someday, I would like that to be me*". This utterance and the fact that the participants voluntarily signed up for the course, showed their engagement in the course, but also a hesitation towards their ability to just pick up the pen and draw in front of others afterwards.

Based on my own teaching experiments from 2015-2018, I also experienced how students stated that "*they cannot draw*" or "*this kind of method is totally out of my comfort zone*" when introduced to graphic facilitation and sketching (Hautopp, 2017). I consider this a significant teaching dilemma within graphic facilitation: how can teachers create a learning environment that can empower participants to gain confidence in their own drawing abilities?

Professor in Design and Arts, Nathalia Ilyin (2019), has written an inspiring book: *Writing for the Design Mind*. The book is targeted at design students who can feel inadequate in writing, because their main skills are drawing and visualisation. This is in a sense the reverse of what many humanities students are confronted with in design subjects, claiming 'they cannot draw'. Ilyin gets furious when she is met by design students who have had the experience of being judged by their teachers as 'you're so visual' with the underlying assumption 'you will never be good at math or writing'. Ilyin asks the question: "*When did we get the idea that being 'visual' means you can't be 'verbal'?"* (Ilyin, 2019, introduction/xxi). I cannot answer this question, but I want to ask the reversed question, because I see a need to address this as well. "*When did we get the idea that being 'verbal' means you can't be 'visual'?*"

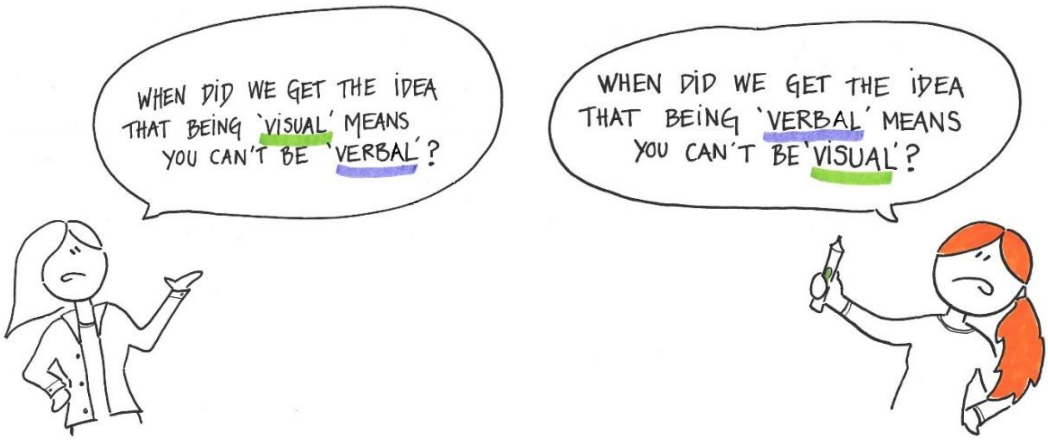


Figure 1: *A visual illustration of the conversation between me and Nathalia Ilyin's (2019) work*

Although educational practices have developed over the last decades, Ilyin (2019) argues that the past division between students as verbally or visually skilled promoted by what Ilyin describes 'as poorly-tested psychological research' (Ilyin, 2019, p. xxii) is still evident in contemporary educational systems as 'these take a while to catch up'. It is relevant to notice, that Ilyin refers to the American educational system that differs from the Danish educational system. I will not go into a thorough analysis of the difference between the two educational systems, but mention that in Denmark, up until the 1970s, we had a similar division of students in upper secondary school into the 'Realen' and '8., 9. and 10. Classes', colloquially also known as the 'academic' and 'practical' groups. Thus, traces of an educational system that privileges the 'verbal' as properly academic and superior to 'visual' ways of working (see also Mirzoeff, 2002) can also be identified in the history of Danish educational system. I agree with Ilyin (2019), who argues that the days of dividing students into one or the other category 'has passed', and just as Ilyin sets out to encourage design students to be more 'verbal' in their academic work, my research project aims at supporting students within the humanities to be more 'visual' in their academic work.

Even though this division of students no longer occurs in the education system, my initial observations confirm that some of the old ways of considering academic practices might still occur in the minds of participants and students in organisational and higher educational contexts. My prior experiences and reflections within graphic facilitation in both organisational and higher educational contexts pointed towards a further exploration in a PhD project.

1.4. Starting point of the PhD project

In February 2018, I started a 4-year PhD project, in which I took a pragmatic approach to the research subject (Dewey, 1922; Brinkmann, 2012). With a Bachelor of Education and a Master's in IT, Learning and Organisational Change, I had a specific interest in investigating teaching and learning processes *through* practice. Thus, I explored educational designs through interventions (Anderson and Shattuck, 2012). I consider my pilot study in 2017 as a context investigation and see my own early teaching experimentations in 2015-2018 as part of the pragmatic approach of building up experiences which have been tested, reflected on, reframed and retested. From 2018 onwards, the research has been more systematically and empirically based, targeting different student groups, specialisations and

courses in higher education (see further description in Chapter 4. Context description and empirical foundation).

Simply observing learning and cognition as they naturally occur in the world is not adequate given that learning scientists frequently have transformative agendas. Education research is an applied field, and learning scientists bring agendas to their work (Barab and Squire, 2004, p. 2). My agenda for the research project had developed since the first time I became acquainted with graphic facilitation. Thus, my agenda is that graphic facilitation *can* be used as an academic method, but the question is to what extent and in which contexts?

The pragmatic approach to the research subject will be described and contextualised in Chapter 3. Furthermore, Design-Based Research will be elaborated as a point of departure for the research approach.

1.5. Research question

In order to investigate the potential use of graphic facilitation in higher education it is crucial to investigate how the method is being practised in an organisational context. As this research project aims to draw lines from the organisational context to a higher educational context, there is a focus on learning processes and teaching processes from both teachers' and learners' perspective. The research question is as follows:

How is graphic and visual facilitation being practised and how can graphic and visual facilitation support design exploration in higher education?

I have investigated the research question through a design-based research approach that typically is a combination of different approaches seeking to understand and develop learning contexts (Barab and Squire, 2004). Thus, I have combined different qualitative approaches investigating the social phenomenon 'graphic facilitation' in different contexts. The two main contexts in the research project are *an organisational context* and *a higher educational context.* The investigation of organisational context is undertaken with a focus on exploring the first part of the research question: *"How is graphic and visual facilitation being practised?"*. Whereas the development of design experiments in higher educational contexts is undertaken with a focus on exploring the last part of the research question: *"How can graphic and visual facilitation support design exploration in higher education?"*

In the design experiments, the students were asked to take the role of designers exploring different problems at hand based on a problem-based learning approach (e.g. Savin-Baden, 2003; Newmann, 2005). I will especially focus on the humanities in higher educational contexts, but also draw on teaching experiences with art and design students.

When students are introduced to design practices in higher education there is also a need for teachers to act as designers of teaching. However, there is little research on how higher education teachers engage in design processes and further studies have been requested (Goodyear, 2015). Thus, this research project joins the ongoing dialogues aimed at understanding education as designs for learning (Boistrup and Selander, 2022). This research project will focus on the teacher's role as a designer, exploring and connecting lines between the design field and the humanities as well as organisational and higher educational contexts.

In Chapter 4, I will describe what constitutes the two contexts: Organisational and Higher Educational, and furthermore how I have investigated these contexts simultaneously using ethnographic fieldwork, interviews and interventions in the form of design experiments.

1.8. Why this title for the PhD project?

The title of the dissertation represents significant aspects of the research project that will be elaborated below.

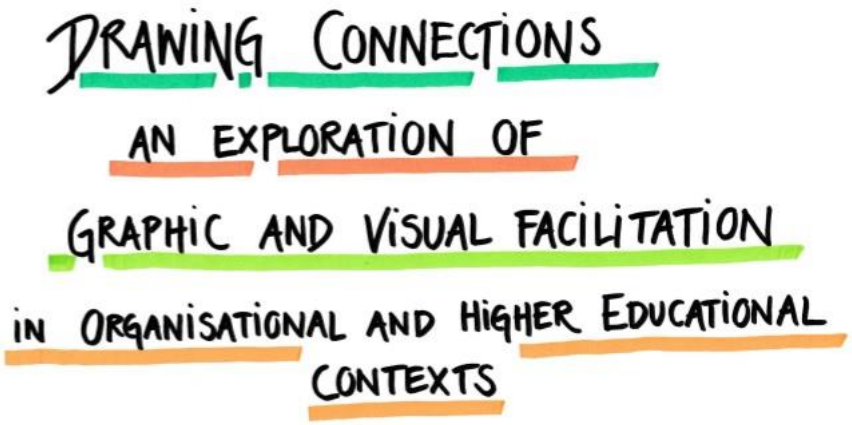


Figure 2: A visualisation of the title of the PhD project

Drawing Connections

As graphic facilitation is not yet established as a research field, the purpose of my approach in this PhD project is to *invite* graphic facilitation into dialogue with other research fields, exploring similarities, differences and nuances. As the title of the dissertation indicates, that I will 'draw connections' between graphic and visual facilitation and other fields and academic disciplines.

From a pragmatic perspective, each time I have published a paper, I have seen this aper as a product, which I have had a conversation with. In this sense, I approach writing similar to 'back talk' in a design process (Schön, 1983) as suggested by Ilyin (2019). These conversations with materials have led to further theoretical reflections and empirical analyses elaborated throughout this dissertation. For example, a further characteristic of 'Drawing as a research object' is an elaboration based on element from Papers 1, 2 and 3. Elements that needed to be addressed in order to characterise different movements in the field. As shown in Paper 2, graphic facilitation relies heavily on visual metaphors. These metaphors are often used to talk about situations and contexts in another way (Frank and Madsen, 2020) and make abstract subjects concrete so they are easy to recognise and recall (Qvist-Sørensen and Baastrup, 2019). Based on the arguments for using metaphors in graphic facilitation, I will also use a metaphor for this PhD project. Besides 'drawing connections', the structure of the PhD project is an 'invitation to dialogues'. Sometimes the conversation takes form as a small-talk briefly connecting areas of reflection, e.g. my conversation with Ilyin's work (2019) in section 1.3., and other times longer continuously conversations are needed in order to e.g. elaborate the pragmatic fundament of the PhD project. I strive that the pragmatic fundament is reflected in the way, I have

conducted the research project as well as in the ways I have presented the project in the written dissertation.

To present my academic inquiry processes, I use the 'a dialogue around the dinner table' metaphor inspired by a lecturer at Absalon university college, Denmark, Marie Neergaard, who has written about dialogical education (Neergaard, 2021). Since I was presented with this metaphor at a research network meeting in 2021, it has stuck with me as an illustrative way of describing how we as researchers combine theoretical perspectives by inviting these into a conversation based on our own empirical experiences and involvement with the theories. As I take a point of departure in the production of materials to drive these conversations (e.g. Goldschmidt, 2003; Hansen and Dalsgaard, 2012), I have developed the metaphor to concern 'a dialogue around a design table', where theories are used as tools to convey new and nuanced perspectives on the empirical materials. This broad understanding of theories (Brinkmann, 2012) connected to empirical data is further elaborated in Chapter 3 and Chapter 6.

Figure 3: The visual metaphor 'The dialogue around a design table'

As mentioned, I see myself as a traveller going into the field connecting my own experiences to the experiences of others. The experiences of others contain both the concrete empirical data that I have produced and collected for this research project, but also experiences from professional graphic and visual facilitators who have made rich handbooks within this field as well as perspectives from other research fields. With this approach, my hope is to discover and show possible connections between graphic and visual facilitation and other research fields and to strengthen the establishment of graphic and visual facilitation as a research field.

An Exploration

Pragmatist John Dewey argues against the traditional separation of theory and practice, emphasising that the "*so-called separation of theory and practice means in fact the separation of two kinds of practice*" (Dewey, 1922, p. 69). Thus, a fundamental assumption in pragmatism is that there is no clear distinction between 'doing a research project' and 'living a life' (Brinkmann, 2012, p. 4). We use theoretical tools to cope with situations and the world, and such coping occurs all the time, in research and in our personal lives. I found this perspective crucial in order to address two important perspectives. Firstly, as elaborated in section 1.4, I consider my experimentation from 2015 as part of

the research project, as these experiences laid the foundation for this research project. Thus, the research project acknowledges a broad perspective on theory (Brinkmann, 2012) where I constantly move between empirical experiences and theoretical reflections, discussing the consequences of my actions.

Secondly, all the practice-based handbooks that constitute the emerging and dynamic field of graphic and visual facilitation are not considered to be anti-theoretical. Quite the reverse; the books are often written by practitioners who have a lot of experience with doing graphic and visual facilitation and many of the books quite explicitly show how the authors have connected their practice-based experiences to theoretical perspectives. Thus, they can be viewed as examples of what Schön (1983) named reflective practitioners. This theoretical perspective on learning through practice will be elaborated in Chapter 6.

To characterize how this research project differs from the other practitioners' books and my own previous explorations in the field, I strive for a more systematic approach to the inquiry processes. Based on Dewey's pragmatism, Brinkmann argues that science can be viewed as a "*condensed form of human knowing or a focused form of the activity of coping with the world*" (Brinkmann, 2012, p. 39). Thus, my aim is to produce a systematic and empirically based longitudinal study in the field of graphic and visual facilitation.

Graphic AND visual facilitation

As will be shown in the literature review (Paper 1) and elaborated in Chapter 2. *Drawing as a research object*, there are many practice-based publications in the field of graphic and visual facilitation. When I first started the PhD project in 2018, I named the research object 'graphic facilitation', but as I went into the field, I discovered manifold definitions describing the visual practice.

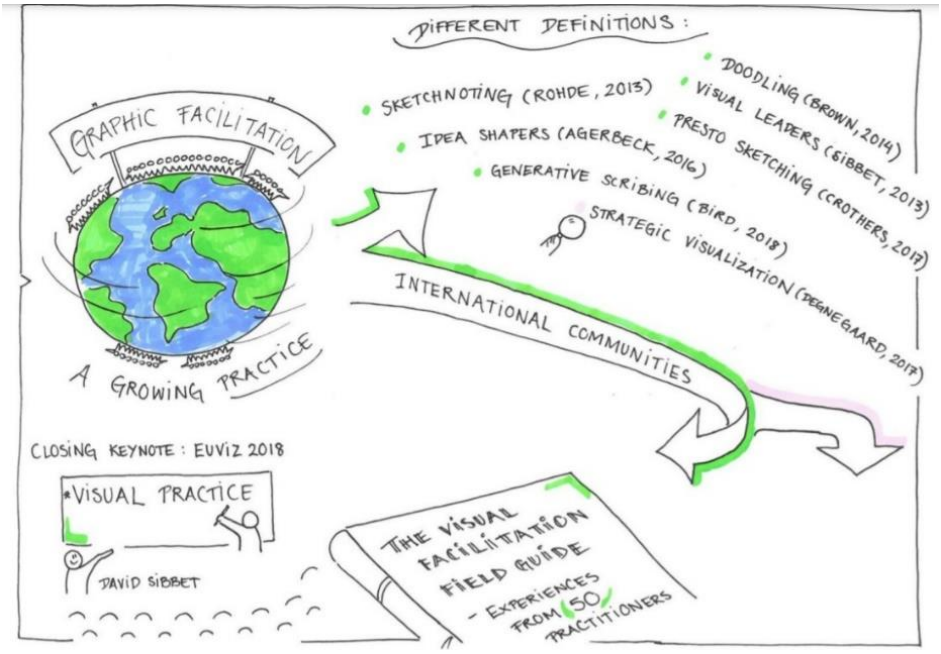


Figure 4: Manifold of definitions in the field of graphic and visual facilitation – fieldwork at EuViz 2018

Figure 4 shows one of my visual field notes from the European Conference for Visual Practitioners in 2018 which was held in Denmark half a year after I started my PhD project. Over 200 practitioners from all over the world participated in the conference, including one of the founders, David Sibbet, who in the final keynote had a focus on mapping the 'visual practice of an emerging field'. As my drawing indicates, I experienced graphic facilitation as a growing practice where other definitions, e.g. Doodling, Sketchnoting, Generative Scribing and Strategic Visualisation were also utilized by the practitioners. However, the definition that struck me most was 'visual facilitation', as this term appeared both in the final keynote hosted by David Sibbet and in an upcoming anthology in the field gathering experiences from 50 practitioners worldwide. The book was published after the conference in 2019 with the title *The world of Visual facilitation – unlock your power to connect people & ideas* by Jereon Blijsie, Tim Hamons and Rachel Smith.

In a later investigation of the terms graphic and visual facilitation, I consulted Google Ngram Viewer (retrieved 2nd of January, 2022) to give me a visual overview of my initial observations. Google Ngram Viewer charts the frequencies of any set of search strings that appears in documents registered in Google's card index. Thus, the chart can give an overview of the publications of the two terms *compared* to each other during a specific period, as illustrated in the graph below.

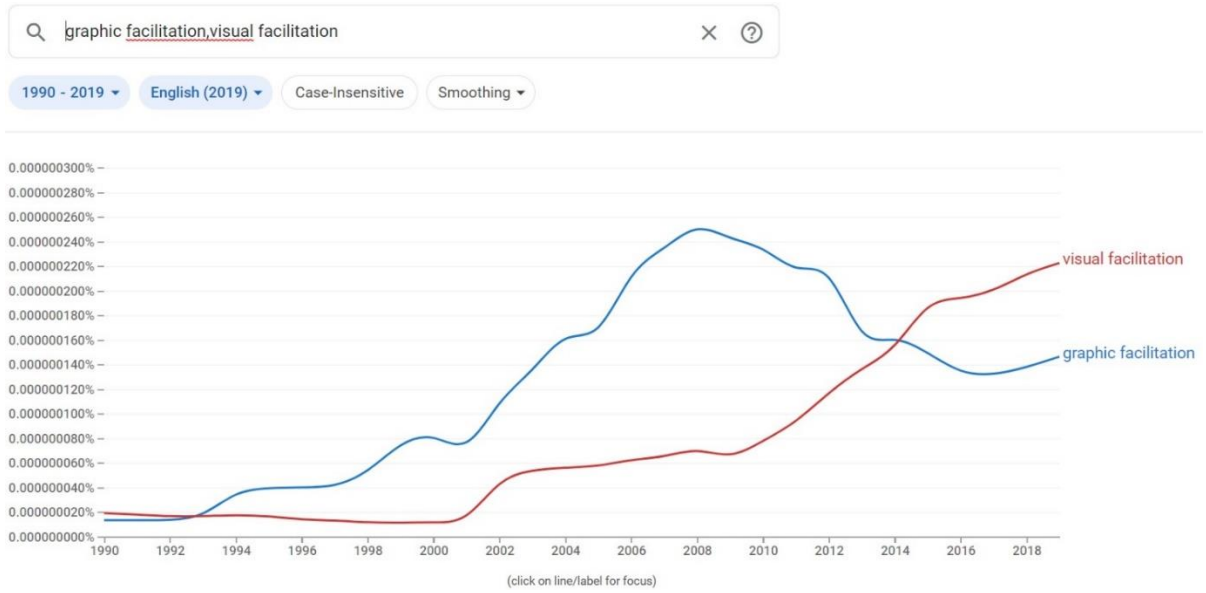


Figure 5: Google Ngram Viewer result for 'Graphic facilitation and Visual facilitation'

As the chart shows, an increasing number of publications used the term 'graphic facilitation' from the 1990s to 2009. Since 2009 there has been an increased number of publications using the term 'visual facilitation'; however, as the graph shows, the use of 'graphic facilitation' still occurs. It is also worth noticing that collectively, the publications regarding both terms have increased since the 1990s, which show an emerging field. My own initial fieldwork and the graph from Google Ngram Viewer can give an overview of the utilization of the two terms as well as a brief argument for why I have chosen to incorporate both 'graphic and visual facilitation' as my research object. Thus, I see both terms as current and relevant terms to capture the field. As this insight is the result of the ongoing inquiry process occurring through the research project, I will elaborate the choice in Chapter 2.

Organisational and Higher Educational Contexts

I will briefly introduce the organisational perspectives and higher educational perspectives that have shaped this research project. This will not be an introduction to the historical development of organisational theory. I will focus on the concrete practices that encompass graphic facilitation, namely different kinds of *meeting* formats (e.g. Sibbet, 2010). The research project takes a point of departure in van Vree's (2011) interpretation of organisations seen as social activities and processes expressed in meetings: "*Organization is normally treated as a thing, but in fact, it is a social activity and process. Anyone who thinks of 'organizing' instead of 'organization' soon enough comes across meetings. Thus, studying meetings and meeting behaviour is a strategic means of approaching the dynamics of organization*" (van Vree, 2011, p. 255). Furthermore, van Vree emphasises that "*the emergence of bigger companies requires new facilities and organizational structures, involving a marked increase in conferences, conventions and congresses to talk and decide about the common future*" (van Vree, 2011, p. 257). In the light of these new requirements, it is relevant to discuss the role of graphic and visual facilitation when participants 'create common futures' together at meetings.

As the research project aims to explore the connection between organisational and higher educational contexts, I will also briefly introduce perspectives from Problem-based learning (hereafter PBL). Problem-based learning has increased in popularity within higher education since the 1970s (e.g. Savin-Baden, 2000; Newmann, 2005). In PBL, students are tasked with a real-life complex problem or challenge as a starting point of their learning processes (Graff and Kolmos, 2003). The purpose of PBL is for students to develop 'criticality', meaning emotional, intellectual and practical independence (Savin-Baden, 2003). Here, the teacher function as a facilitator and the students should primarily navigate through self-directed processes and collaboration in groups investigating the problem at hand (Newmann, 2005). Thus, it can be argued that the students' collaborative design and PBL processes can be related to Vree's (2011) perspectives on meetings, where students also meet in groups to create 'common futures'. The connection between graphic facilitation, meetings and PBL group processes is elaborated in Chapter 4. Here, I will also position the research project in relation to the visual and material turn in society (Mirzoeff, 2009) and in organisations (Boxenbaum et al., 2018).

Chapter 2: Drawing as a research object

This chapter revolves around investigating the first part of the research question: *How is graphic and visual facilitation being practised?* Furthermore, graphic and visual facilitation is constituted a research object in this project. Since 2018, when I conducted a literature review (Paper 1) on 'graphic facilitation' and the 'graphic facilitator' together with my supervisor, Rikke Ørngreen, new movements have characterised the field of graphic facilitation. Inspired by Thorup's (2019) approach to intellectual history, I will try to identify central aspects, tendencies, ambiguities and vocabulary within the field, which were not addressed in the review. I will elaborate upon different perspectives without expecting that my answers will satisfy everyone present in the field. However, the aim is to point to tendencies within the graphic and visual facilitation practices, and to set a further direction for this research project.

A fundamental assumption is that humans are participants in social practices. Brinkman (2012) argues that social practices are the fabric of our social lives and have (at least) three aspects: *experience, discourse and objects* (Brinkmann, 2012, p. 47). Brinkmann emphasises that good research consists of perspectives on all three aspects; however, objects are often neglected in social science. In Paper 2, the research object consisting of *basic elements* in graphic facilitation are briefly described, as are the roles within graphic and visual facilitation in Paper 3. However, in this section, I will go into a more detailed description of the roles and objects, which are central to grasping the social practice of graphic facilitation. Many publications within the field aim to coin the characteristics of graphic and visual facilitation. To present these characteristics, I draw on Rachel Smith (2014), who elaborates how graphic facilitation revolves around three central components: *the facilitator, the visual display and the participants*.

Smith further emphasizes that the interplay between the components is crucial in graphic facilitation: "*As in any meeting, the facilitator and the participants interact with each other. However, each also interacts with the visual display: the graphic facilitator creates it and uses it as a facilitation tool, and the participants interpret, reflect on, and sometimes add directly to it"* (Smith, 2014, pp. 18-19). It becomes relevant to characterize and investigate the interplay between the components in graphic facilitation, as these can be seen as constituting the research object of the study. The first three sections in the chapter are aimed at illuminating the central aspect of the research object. The last two sections in the chapter present two further perspectives derived from the literature review in Paper 1, pointing to digital possibilities as well as expanding definitions in the field besides 'graphic facilitation'.

2.1. The visual display – basic elements

In this section, I will present some basic elements – the concrete drawings – which can be characterized as a central part of the research object in this PhD project. The basic elements of graphic facilitation can be derived back to the founder of the Grove Company in California, David Sibbet's Group Graphics® Keyboard (Sibbet, 2008), which at the date of publication summarized Sibbet's experiences of facilitating groups visually.

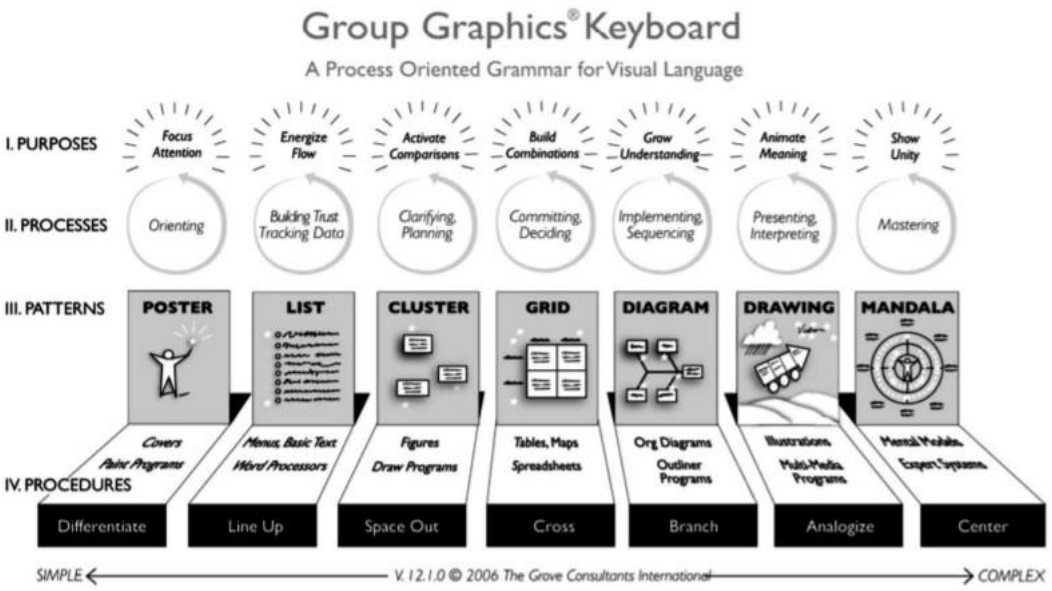


Figure 2. The Group Graphics® Keyboard.

Figure 6: The Group Graphics® Keyboard, Figure 2, Sibbet, 2008, p. 121

Sibbet emphasises that the Group Graphics® Keyboard can be used by graphic facilitators to decide which visual patterns to use at different stages of a group process, ranging from the simplest on the left to the most complex on the right. As mentioned in Paper 2, other companies have been inspired by Sibbet's diagram and the Grove's work and have developed their own style and focus on the basic elements, e.g. Bikablo in Germany and Bigger Picture in Denmark. I have especially been inspired by Bigger Picture's The Seven Elements TM, which they describe as "*a shortcut to a visual language*" (Qvist-Sørensen and Baastrup, 2019, p. 42). The seven elements consist of 1) people, 2) places, 3) processes, 4) speech, 5) text, 6) colours, and 7) effects. Bigger Picture emphasises that the seven elements can be used in meetings, processes and projects. Based on the seven elements, Bigger Picture argues for adding an 8th element: "*Your own visual language*", where you as facilitator can expand your visual vocabulary, creating and combining icons specific to your own context (Qvist-Sørensen and Baastrup, 2019, p. 72). In this way, they also operate from a simple level to a more complex level as suggested by Sibbet (2008). Likewise, the author encourage the readers to develop their own visual language, highlighting the personal dimension of using the visual methods, which mirrors other authors' advice in the field (e.g. Agerbeck, 2012; Nielsen et al., 2016).

Besides providing a written introduction to the elements in their recent book *Visual Collaboration – A Powerful Toolkit for improving Meetings, Projects and Processes* (Qvist-Sørensen and Baastrup, 2019, pp. 42-72), the Bigger Picture company has made two short videos, already shared on their YouTube channel back in 2013, which the screenshots in Figure 7 are from.

Figure 7: Screenshots from the Bigger Picture videos on visual facilitation

Figure 7 shows screenshots from Bigger Picture's videos: "Learning Visual Facilitation – Seven Elements by Bigger Picture" (left) and "Learning Visual Facilitation – Eight Element by Bigger Picture" (right). In the book and the videos, Bigger Picture argues that the value of visual language increases when done in a collective process in a team or a meeting (see my highlight in the picture of the group discussion). Thus, they highlight the value of the interplay between the three components of the facilitator, visual display and participants, also suggested by Smith (2014). In the next section, the two other components, facilitator and participants, are outlined and addressed in relation to this research project.

2.2. The roles in graphic and visual facilitation – facilitator and participants

When aiming to define graphic facilitation, the social aspect of leading and supporting group processes is highlighted. Sibbet explains that "*Graphic Facilitation is an interactive style of leading groups using large-scale imagery and displays"* (Sibbet, 2001, p. 1). Agerbeck also expresses the social aspect of graphic facilitation, pointing to the large wall-papers as a central element: "*Graphic facilitation is serving a group by writing and drawing their conversation live and large to help the group do their work*" (Agerbeck, 2012, p. 9). Thus, the social interaction between the facilitator and participants is emphasised. The aim is not document every step of a meeting, but to capture the essence of participants' ideas (Sibbet, 2010) and thereby create a shared understanding in the group as their ideas and uttarances becomes more tangible and concrete on the wall-paper (Agerbeck, 2012, p.40).

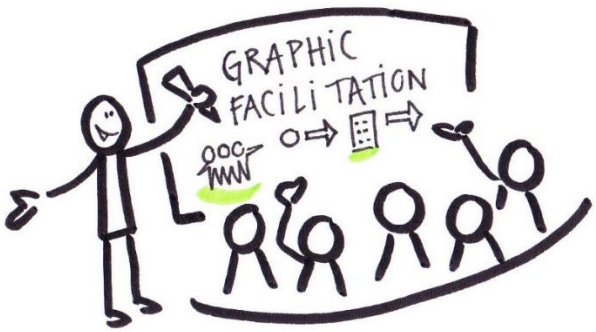


Figure 8: A visual illustration of a graphic and visual facilitation context

Figure 8 shows how a typical graphic facilitation process takes place, organised by a facilitator drawing on large-scale wall-paper to guide the group processes. Thus, the original way of describing graphic facilitation consists of the facilitator drawing and the participants contributing through utterances. Recent books from the practice field encourage facilitators to get a marker in participants' hands to involve them as active drawers in the ideation and dialogue processes (e.g. Sibbet, 2010; Nielsen et al., 2016; Blijsie, Hamons and Smith, 2019). However, there is a lack of empirical research on the teaching of graphic facilitation to employees seen as active drawers, not just at current and solitary meetings organised by an external graphic facilitator, but in long-term perspectives where we follow the participants from participating in basic graphic facilitation courses (see figure 9) to actively implementing graphic facilitation practices in their daily work. Thus, this research study has a focus on these perspectives.

Figure 9: A visual illustration of a graphic facilitation teaching session

Besides investigating participants as active drawers in organisational contexts (Papers 2 and 3), design experiments in higher education have been facilitated where students are also positioned as active drawers using graphic and visual facilitation over time during their group processes (Papers 4, 5 and 6). Other practice-based books present cases of teaching graphic facilitation in educational settings in elementary school (Frank and Madsen, 2020) and college (Musgrove, 2016), but this current research advocates for longitudinal empirically based research in higher education.

2.3. The interplay – process over product

In this section, I will firstly draw connections between graphic and visual facilitation and the design practice by focusing on the drawing objects within the fields. Secondly, I will try to connect the design field and the humanities by stating the assumption that graphic facilitation might be a drawing practice that can be related to the students' practices within the humanities, when they are developing learning and communication designs. Agerbeck (2012) emphasises that graphic facilitators are "*process-focused, and know how to reflect their [the teams'] process and their progress through visuals*" (Agerbeck, p. 9). Likewise, Sibbet argues that the Group Graphics® keyboard illustrates a focus on "*looking at graphic displays as artifacts of a process, and holding the process as more fundamental than the form"* (Sibbet, 2008, p. 120). This process focus in graphic facilitation differs from the design field, where the designer makes concrete products (Schön, 1983).

Based on the sources mentioned in section 1.2, it can be argued that there is a movement from both inside the architecture and design field and from outside these fields with the aim of broadening design practices beyond the original fields. Likewise, much has been written about how research practices in the design and academic fields have similarities. I cherish this movement and argumentation and will build on these perspectives in this current research project. However, while trying to draw connections between the architecture and design field and the humanities, it is also relevant to outline some differences. If we argue that the act of sketching and using visual methods can be significant ways of working across fields, it is relevant to more closely examine *what* and *which content* students in higher education in the different fields are tasked to work on. Schön elaborates how architects and designers typically work: "*A designer makes things. Sometimes he makes a final product; more often he makes a representation – a plan, program, or image – of an artefact to be constructed by others"* (Schön, 1983, p. 78). Despite the iterative and complex process of sketching ideas in several loops, architects and designers typically have a focus on a *concrete* product or building for themselves or others to construct. If I turn to students within the humanities, they typically work with *processes* and concepts, with less of a focus on concrete products. For example, humanities students can work on developing a design that should enhance learning and communication within a specific target group. As one of the student quotes from the analysis in Paper 5 shows: "*You can talk about innovation, but how might you make a design about it? How can we make a product that supports [the process of innovation]? In other words, we can talk about it, but how should it look visually*?" (Hautopp and Buhl, 2021, p. 327). This quote illustrates reflections in a student group within the humanities who decided to develop a digital learning design that should enhance innovation and creative skills among teacher students. The relevant question of 'how does innovation look visually?' highlights the complexity in drawing the concepts. As within the architecture field, the concepts may also be of relevance for others to construct, e.g. in a digital learning app, but there is not the same requirement that the visual materialisation of the concepts of innovation will end up as a 1:1 model of the final product. The similarities and differences between the act of drawing in architectural education and in humanities education are further addressed in Paper 5, where we examine 'drawing as an academic dialogue tool', focusing on the collaborative aspects of drawing as a tool to enhance group processes. In addition to the analysis in Paper 5, a further comparison of the two fields are addressed below.

Schön (1983) argues that drawing and talking are parallel ways of designing, and together they make up what he calls the 'language of designing', where the verbal and the non-verbal actions are closely connected (Schön, 1983, p. 81). Thus, he also argues for the collaborative aspect of sketching ideas, to spark thinking and dialogues with others as seen in the graphic and visual facilitation field. Schön (1983) also presents a case from a design studio: "*a type of professional education, traditional in schools of architecture, in which students undertake a design project under the supervision of a master designer"* (p. 79). He very vividly and with great detail describes the drawing and dialogue session between a student and her teacher, where the reader can follow the 'language of designing', which he theoretically connects to the concepts of back-talk, reflection-in-action, etc. The interplay between the student, the teacher and the sketches or visual display is emphasised, but the collaborative interactions between the students are missing. In a recent PhD project, *Learning by Drawing: Investigations into Danish Architecture Education*, Hyam (2020) illuminates different teaching activities in architectural education: *desk crits* and *pin-ups* (Hyam, 2020, p. 139). Desk crits (in Danish: tegnebordsundervisning) can be related to the supervision of a master designer or teacher as explained by Schön (1983), while the pin-ups can be characterised as a presentation in an exhibition at the end

of the semester, where students share and reflect on their work in front of external partners, jury and teachers.

As part of my fieldwork, I participated in a one-week course held by Copenhagen Art School framed as 'a preparation for a design and architectural education'. The aim for me was not to attend design schools after completing the course, but to experience drawing exercises targeting these kinds of educations. It was a very inspiring week with an engaged teacher and a small peer group, where we also experienced what I perceive could be characterised as Desk crits (Hyam, 2020). One example was that we spent three hours learning how to draw a cup (see figure 11), where we first observed the teacher and then did our individual drawings seated at our desks, guided by the teacher, who walked around giving feedback.

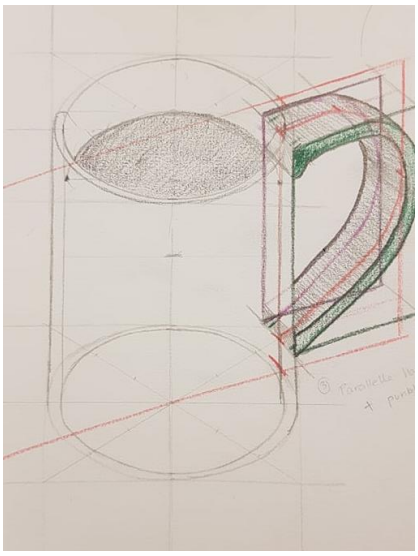


Figure 10: My drawing of a cup – fieldwork at Copenhagen Art School

At the architect education, Hyam (2020) observed that the peer-learning that took place along with the desk crits and pin-ups formed the foundation of the students' creative processes of learning to think *through* their drawing processes (p. 144). However, these peer-learning activities were not visibly organised by the teachers (Hyam, 2020, p. 145). Hyam's research showed that the students appreciated and benefitted from their self-organised peer learning activities.

When I try to draw connections between the architecture and design field and humanities, I emphasise the sketching activities as central to the 'language of designing'. Thus, each of the design experiments presented in Papers 4, 5 and 6 takes inspiration from the architectural and design field (e.g. Schön, 1983; Goldschmidt, 2003; Twersky and Suwa, 2009; Hyam, 2020). I also address the teacher's role of introducing drawing exercises (see Paper 5) and the idea of organising exhibitions where students show their final exhibition to external partners (see Paper 6). However, when organising design experiments, I focused more on the social aspect of the drawing activities connected to the collaborative PBL processes. Drawing is a craft, and the more you practice, the better you get (Edwards,

2012). I have high respect for both architects and designers and after attending the one-week course at Copenhagen Art School, I also admire the patience and detail orientation that was applied when we for example were drawing the cup. I also learned new techniques in relation to perspective drawing and spatial understanding. However, I will argue that these kinds of details requested for designing a specific product (of course, these can be more complex than a cup) are not of the essence when students from the humanities are designing concepts of learning and communication. Here, the act of drawing is process oriented (Agerbeck, 2012), concerned with the discussion of concepts, rather than product oriented, i.e. focused on the development of a specific product.

2.4. Digital possibilities in graphic and visual facilitation

As mentioned in the literature review, there seems to be a growing interest in digital possibilities when using graphic facilitation (Paper 1). Smith (2014) argues that the traditionally analogue pen and paper practice from graphic facilitation can be translated into so called "*virtual graphic facilitation*' meetings (Smith, 2014, p. 26). In fact, Smith advocates that "*virtual graphic facilitation can make remote meetings more engaging and efficient, increase creativity and retention, reduce multitasking, make it easier to achieve meeting outcomes, and reduce the perceived agony of meeting online*" (Smith, 2014, p. 28). She refers to experiences from the Grove Company founded by David Sibbet who also shares the excitement of digital possibilities within graphic facilitation (Sibbet, 2013). The growing interest in digital possibilities is also reflected in the chapter section 'Beyond the Paper' (Blijsie, Hamons and Smith, 2019, p. 381-459) where professional practitioners share practice-based examples of different digital graphic facilitation practices.

As mentioned in Paper 1, this PhD project also sets out to explore the emergent focus on digital possibilities within graphic and visual facilitation practices (Hautopp and Ørngreen, 2018, p. 53). Thus, I organised a "Workshop with graphic facilitators– exploration and development of analogue and digital possibilities within graphic facilitation practices" (2018). The workshop was held in collaboration with associate professor of strategic design, Peter Vistisen, and the purpose was for us to gain insights into the participating facilitators' views on the affordance of analogue and digital tools within their own work practices. Below, extracts from the dialogue at the workshop will be combined with findings from other interviews with graphic facilitators (see further description of the groups in Chapter 4).

Four professional graphic facilitators participated in the workshop. They had different years of experience within both the use of graphic facilitation and within the use of digital drawing tools and programmes. At the beginning of the workshop, we prompted the participants to draw and share their immediate experiences and positions towards the different analogue and digital drawing tools.

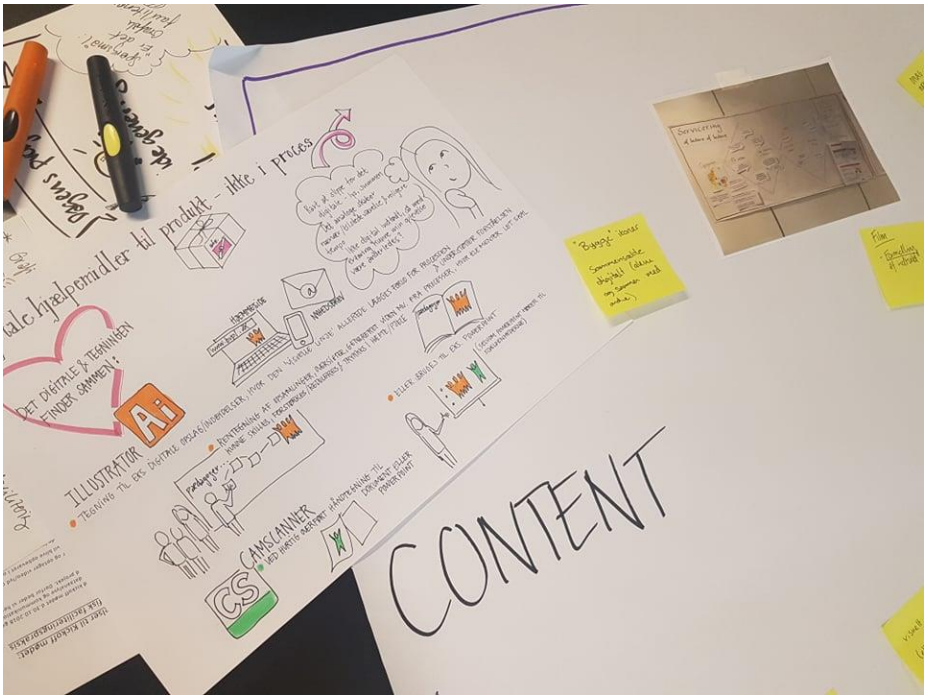


Figure 11: Participant's drawing of herself reflecting on her approach to analogue and digital drawing tools

Figure 11 show one of the participants, who have prepared a drawing representing her thoughts about the use of digital tools in graphic facilitation. Under the headline: "*Digital tools for product – not for process*", she outlined her considerations in a thought bubble: *"[It is] nice to escape the digital. The analogue creates presence and a more quite pace. [I am] not a digital native, so perhaps with experience my perception would be different*?". The first part of the quote about the presence and quiet pace provided by the pen and paper echoes what other visual practitioners emphasise about the analogue qualities of the method (e.g. Bird, 2018; Frank and Madsen, 2020). Likewise, the second part of the quote, where the facilitator reflects on the connection between her perception of the analogue and her own lack of experiences with digital drawing tools, is relevant. From a pragmatic perspective on learning, it can be argued that the participant has less experiences on which to reflect (Schön, 1983), of which she shows awareness by posing the question.

Another participant at the workshop expresses how she is accustomed to using digital tools in her daily work. She perceives an advantage in using a drawing programme such as Adobe Illustrator to make a finished presentation drawing based e.g. on a workshop process held in an organisation. She elaborates upon how the digital version can "*decompose the chaos that can be in a hand drawn visualisation*". Likewise, the digital version makes the drawing distributive to other departments in the organisation. However, the participant emphasises the importance of preserving the 'hand-drawn feeling' in the digital drawing: "*When people make a sketch in collaboration, they take ownership of the process. Then, when I make a digital version, it is supposed to be a cleaner expression. However, I still have to be true to the original version, otherwise the participants lose their ownership. So it is a delicate balance with the digital approach, because how clean may the digital version be? Because we like to maintain the hand-drawn feeling*". It can be argued that the graphic facilitator here expresses that a process-oriented focus (Agerbeck, 2012) in her facilitation is more important than a product-oriented focus. The dialogue at the workshop led to further discussion among the participants

regarding the point that digital versions of drawings also opened up for iterative adjustment processes, which could be both beneficial when making adjustments, but also a challenge, because "*how do you decide that the drawing is finished*?". One challenge discussed was that the facilitaors' clients could become more product-oriented with all the details they wanted to be adjusted, because the digital illustrations "*hold the expectation to look perfect*", as one participant expressed.

At the end of the workshop, the participants were asked to collectively draw their main insights from their discussions of the day.

Figure 12: Participants' drawing on main insights from the workshop day

In figure 12, the central question for the participants at the workshop was, when we work with digital tools in graphic and visual facilitation "*How do we incorporate the process?".* The question in the bottom right, "*Can we maintain a playful ease in the final product*?", can be related to the participants' experiencing a switch to a product-oriented mode from their clients when the drawings become digital. It can be argued that the participants at the workshop appreciated the analogue practice with participants at the workshop, while the use of digital drawing tools was reserved for the subsequent processing of the drawings into a digital version to be distributed. Furthermore, a photograph taken of an analogue wall-paper drawing was also mentioned as a way to distribute the visual materials online in the organisation.

As mentioned, I have a particular research focus on the teaching and learning processes in relation to graphic and visual facilitation. Thus, I was also interested in how the facilitators arrange their teaching regarding the use of analogue and digital tools. When I relate the insights from this workshop to other empirical data, all the graphic and visual facilitators whom I have interviewed between 2018 and 2019 organised teaching on location with the introduction of analogue drawing tools: pen and paper. One

teacher elaborated in the interview as follows: "*We do not make courses where participants are doing digital drawings. There are probably good reasons for making these kinds of courses, when the technology is a bit more available. Our experience is that everyone appreciates the hand-held and analogue format."* He further elaborates upon how the tactile and kinesthetic experience is relevant, which can be related to the pragmatic understanding of learning through craftsmanship (Brinkmann and Tanggaard, 2013). Other teachers also address how they see potential in the digital format, but prefer the analogue format when teaching basic courses of graphic facilitation while there is a "*low threshold for participation*", because everyone "*can manage pen and paper*". Furthermore, the analogue approach mirrors the origins of graphic facilitation practice (Sibbet, 2001).

In the beginning of the research project, I mirrored the organisational practice of teaching students on location using analogue tools. This choice could also be related to the reflection made by the participants in figure 11, which resonated with me. I both cherished the analogue format and lacked experience in using digital drawing tools. At the same time, I agree with the majority of the interviewees who teach analogue drawing techniques to participants for them to acquire new skills with a low threshold and no additional expectation of managing digital programmes. As one graphic facilitator experienced, when she worked as an illustrator: *"Within the field of graphic design, we work a lot on the computer. So my work practice was centred around the computer, and I actually was drawing less than before".* Afterwards, she emphasised how she was excited to become acquainted with graphic and visual facilitation to rediscover her analogue drawing practice. Based on the abovementioned findings, it can be argued that there is a tendency for basic graphic facilitation courses to be held with a focus on analogue materials, and that the use of digital tools demands practice and does not necessarily promote the explorative process of drawing, while a separate focus on aesthetic expression might interfere.

When the abovementioned analysis is made, it is also relevant to outline different combinations of analogue and digital materials when organising teaching that involves the use of graphic facilitation, which this research project also sets out to explore. For example, this may include remote or hybrid meeting formats, where participants and the facilitator/teacher are distributed at different locations (Smith, 2014) and where a document camera is used to project the analogue drawing introduction across locations (see Papers 5 and 6). Likewise, the connection between the students' use of analogue drawing and their development of digital learning designs is further discussed in Paper 5. In relation to the analysis in this section, it is also relevant to mention that the workshop and interviews with graphic and visual facilitators were conducted from 2018 to 2019 as part of my investigation into the organisational context. Hence, the interviews took place before the COVID-19 pandemic, which has forced many companies to rethink their practices of having more focus on digital and online practices. In the last couple of years, many of the participating companies of this research project have developed their teaching portfolio to include online courses on remote visual facilitation and courses in drawing on iPads, etc. Furthermore, there has been an increased interest in the use of the online platform Miro (https://miro.com/) to simulate a physical workshop environment typically for doing graphic and visual facilitation. It is beyond the scope of this research project to do a more thorough analysis of this 'digital turn' in the field, but I will propose future research on the subject.

2.5. Expanding the field – graphic and visual facilitation

In this section, I will elaborate upon the movement from graphic facilitation (a term used especially from 1990 to 2009) to visual facilitation within the field (a term used especially from 2009 and forward). Furthermore, I will address how I have worked with the two terms throughout the research project. One of the founders of graphic facilitation, David Sibbet, is also the author of several cited books within the field: *Visual Meetings* (2010), *Visual Teams* (2011) and *Visual Leaders* (2012). In 2019 he also published a book entitled *Visual Consulting* together with his wife, Gisela Wendling (Sibbet and Wendling, 2019). On his homepage, the books are categorised as the 'Visual Facilitation Series' (https://davidsibbet.com/visual-facilitation-series/). However, in his earlier publications, Sibbet uses the term 'Graphic facilitation' (Sibbet, 2001, 2006, 2008; Margulies and Sibbet, 2007). As mentioned in section 1.7, I have observed a frequent utilisation of 'visual facilitation' over the four years in which I have carried out the research project. However, the use of 'graphic facilitation' is also occurring and I find both terms relevant for describing the field, upon which I will elaborate, below.

When we look at two anthologies published in recent years within the field, *Drawn Together Through Visual Practice* (2016), edited by Agerbeck, Bird, Bradd and Sherpard, and *The World of Visual Facilitation – unlock your power to connect people and ideas* (2019), edited by Blijsie, Hamons and Smith, the term 'visual' is used. Furthermore, the shared spirit in the visual community becomes evident. The books represent stories from 27 and 50 visual practitioners, respectively, from the field internationally. In the books, the editors specify how they gathered around the book productions with a mutual interest of sharing experiences across the field. Furthermore, they describe how they have reached out internationally for different contributors to the book and, in one of the books, the process of producing the book is explicitly elaborated upon, describing a book sprint hosted and facilitated between three different regions: the North American, the European and the Asian-pacific regions (Blijsie, Hamons and Smith, 2019). The focus on shared practice internally is also evident in the International Forum of Visual Practitioners (IFVP) (https://ifvp.org/) and in the European counterpart, EuViz, which hosts the European Conference for visual practitioners, in which I participated in 2018. Here the facilitators are named 'visual practitioners' which is also a common term used in the field. When I have addressed people by profession in this research project or named their courses, I have used the term, which the facilitators themselves used.

Agerbeck et. al. (2016) describe "*Visual practice as a rich and diverse field*" (p. 2) and, in both anthologies, there are examples of related expressions such as dancing, video, animation, art therapy, storytelling, kinesthetic modelling, etc. It can be argued that these practices push the boundaries of the original analogue pen on wall-paper practice as described by Sibbet (2001). As the authors further note: "*Drawing can take infinite forms*" (Agerbeck et. al., 2016, p. 1). Thus, to broaden understanding, the use of 'visual' could point to a different understanding of the two terms. However, I also see evidence of the two terms encompassing the same meaning.

For example, if we conduct a Google search of '*graphic facilitation*' and '*visual facilitation*', only the first concept has a Wikipedia page. The book *The World of Visual Facilitation – unlock your power to connect people and ideas* (2019) commences with an introductory note from Wikipedia stating the following: "*Visual facilitation: Graphic **(or visual)** facilitation is the use of large-scale imagery to lead groups and individuals towards a goal* (…)" (Blijsie, Hamons and Smith, 2019, first page (no number), my emphasis). It can be argued that the authors see similarities between the concepts, as they have

inserted '(or visual)' in the definition of the concept of graphic facilitation. Furthermore, companies have in recent years changed their content description from graphic facilitation to visual facilitation in their video tutorials (Bigger Picture, 2013a, 2013b), also suiting their new book publication within the field: *Visual collaboration* (Qvist-Sørensen and Baastrup, 2019). However, the content of the videos is still the same, which also points to similarities between the concepts viewed by the authors. An international Facebook group with 15,400 members, including practioners, who use both terms – and other terms – is called 'Graphic Facilitation' (https://www.facebook.com/groups/2708716559).

If I look at the practice in Denmark, there is also a Facebook group called "Graphic Facilitation in teaching and team collaboration" (in Danish: 'Grafisk Facilitering i undervisningen og teamsamarbejdet' (https://www.facebook.com/groups/466856716680421). Here, teachers and facilitators with different years of experience within the field are encouraged to share their work and ask questions. In the interviews with Danish professional facilitators, who also take part in the international community, they share that they have noticed the shift towards a larger use of visual facilitation. One facilitator expresses how she has observed the discourse around the two terms: "*Some people relate the term 'graphic' facilitation to 'oh, then you are educated as an illustrator', where the term 'visual' facilitation can indicate a broader understanding. On the other hand, the term 'visual' can encompass much more than drawing*…". This quote points to an ambiguity in the field, where different meanings of the terms are negotiated. However, as another of the facilitators elaborated: "*In a Danish context, I will continue to use the term 'graphic facilitation', because this is the term that is frequently used in Denmark*". The two basic graphic facilitation courses that I observed back in 2018 also used the term 'graphic facilitation' (see Paper 2). However, when I look at publications within the field from Danish authors, there seems to be usage of both terms.

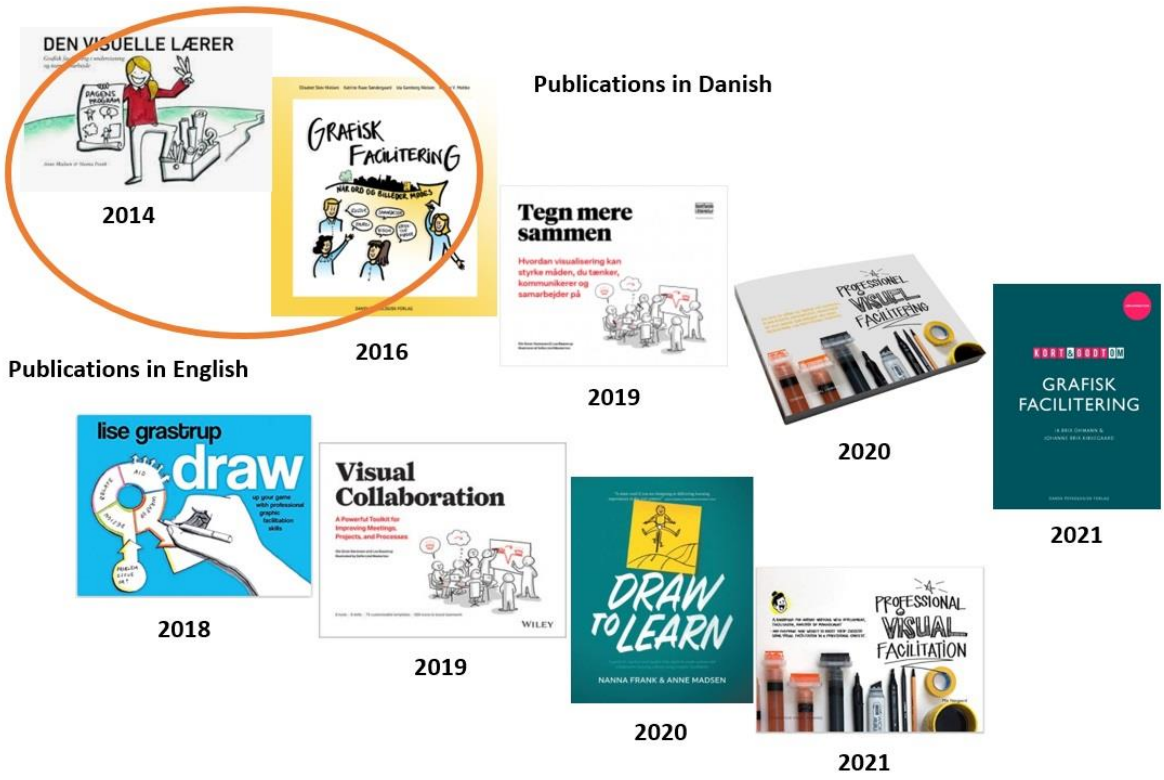


Figure 13: Visual overview of the publication from Danish authors within the field

I will not go into a thorough analysis of the different handbooks, as many of them are cited elsewhere in the dissertation. However, I will emphasise the following two points. 1) In the beginning of my research project in February 2018, there were two handbooks published by Danish authors (marked with an orange circle in Figure 13), and now in 2022 the number has increased to nine. 2) Danish authors also direct their attention to a growing international market, as four books are currently published in English. Furthermore, Bigger Picture has published their book in eight languages (Qvist-Sørensen and Baastrup, 2019).

Based on the abovementioned identification of movements in the field, I will not ultimately define the difference between graphic and visual facilitation, because I cannot seem to find empirical evidence of a clear division. Thus, I refer to both terms in the dissertation. There seems to be a practice of sharing and developing the field, which is a tendency that this research project will tap into by exploring graphic and visual facilitation combined with other methods and technologies. Because of the exploratory approach in the design experiments (see Papers 4, 5 and 6), I have chosen to use the term 'visual facilitation', while at the same time addressing the relation to 'graphic facilitation' (see Paper 4). In the literature review (Paper 1), the term 'graphic facilitation' is solely used, because this review was conducted before the awareness of the frequent usage of 'visual facilitation'. In Papers 2 and 3, the term 'graphic facilitation' is used, because it takes a point of departure from the specific context, where the basic graphic facilitation courses were named 'graphic facilitation'.

2.6. Summary

In this section, I will summarise what constitutes graphic and visual facilitation as a research object in this project. Based on Smith's (2014) three central components, *the facilitator, the visual display and the participants*, I have outlined a significant direction for this research project. In graphic and visual facilitation, drawings are used to highlight key elements of dialogue to create shared understanding in groups. Thus, the social aspect and process orientation are identified as significant for the field (Agerbeck, 2012), and are differentiated from the predominant product orientation in the architect and design field (Schön, 1983; Hyam, 2020). Based on scarce research within the field of graphic and visual facilitation, the research focus will be on long-term perspectives on teaching and learning processes, where participants are viewed as *active drawers* acquiring basic drawing techniques. Analogue teaching formats are identified as significant for participants to enter the field of graphic and visual facilitation with a focus on introducing simple drawing techniques, which are developed into a personal style and vocabulary targeting the participants' own contexts (Qvist-Sørensen & Baastrup, 2019). The analogue formats are identified to support an explorative approach when used in collaborative processes, but the potentials of combining analogue and digital formats are also outlined for further research, where some aspects are addressed in the design experiments. Especially a focus on remote and hybrid formats seem relevant due to the rethinking of meeting practices during and after the COVID-19 pandemic. To investigate the field, I use both graphic and visual facilitation to capture the movements in the field, as these terms are identified as currently being used. The broader understanding that 'visual' might indicate is chosen as a term in the design experiments, where I explore e.g. visual facilitation combined with animation-based sketching (see Paper 6).

Thorup (2019) elaborates upon how *his personal approach* to intellectual history is intertwined with the history of his profession. Thus, his description becomes 'personal – professional'. Also in line with the pragmatic approach to this research project (Brinkmann, 2012), I consider the description in this

section as my ‘personal – professional’ view on the field of graphic and visual facilitation. My practical involvement in the field is the very foundation of my research into the field and, at the same time, what I can say about the field is with reservations to my specific practical involvement. Another researcher would probably have done it differently, and also taken her own local context into consideration. Thus, the chapter does not aim to give an objective description of a defined field of graphic and visual facilitation, but to give insights into a field on the move, based on my different empirical and theoretical reflections during the last four years. The purpose is to be transparent in the different steps taken in the inquiry processes of researching the field of graphic and visual facilitation.

Chapter 3: Research design

In this chapter, I will describe central pragmatic perspectives that have informed my research design in this PhD project. The American philosopher and educational reformer, John Dewey, tried from the beginning of his career to overcome the view of the knower as a passive spectator that we have inherited from the Greeks. He argued that: "*stimuli do not passively impinge on the human senses, but instead arise when active knowers are engaged in various activities*" (Brinkmann, 2012, p. 38). Several scholars draw on Dewey's perspectives, e.g. within educational research proposing an epistemology of the hand (e.g. Brinkmann and Tanggaard, 2013) and within the design field stating that Dewey's framework is relevant when examining the productive qualities of physical materials in collaborative design sessions (e.g. Hansen and Dalsgaard, 2012). Furthermore, design-based research suggests a pragmatic philosophical underpinning, where the value of doing educational research and building new theory lies in its ability to produce changes in the world (Barab and Squire, 2004). In this research project, I will draw on pragmatic perspectives on inquiry processes, which have laid the foundation for how I have conducted the design-based research project and developed design experiments.

3.1. The use of theory to reflect and validate personal experiences

Brinkmann emphasises that interpretative qualitative research should build on questions and problems that are of genuine interest to the researcher: "*If our human and social science research projects are not existentially important to ourselves, there is a real risk that they will not be important to anyone*" (Brinkmann, 2012, Acknowledgements). Brinkmann further elaborates: "*On the other hand, if they are urgent and important from our own everyday life perspective, there is at least a chance that they will be so from the perspectives of others*". As shown in the introduction, the exploration of graphic and visual facilitation is an important matter from my own everyday life perspective. However, the personal dimensions in research should also be seen as instrumental for understanding more general issues about culture and society (Brinkmann, 2012, p. 5). Brinkmann further develops an argument that theory in a broad sense is what enables researchers to go from personalised analysis to social analysis with broader validity and generality. Thus, I have continuously aimed to reflect on my personal practice experiences in relation to theoretical perspectives and the work of others.

If we look at Paper 2 as an example, I conducted participatory observations in two basic graphic facilitation courses with two different professional graphic facilitators in their role of teacher, teaching the method to employees from different companies. After the observations, I took my preliminary analysis of humour and visual metaphors and discussed these findings together with the teachers. Thus, the aim was to 'give voice' to the teachers' interpretation of the teaching situation in order to challenge and give nuance to my preliminary analysis. For example, I was surprised by how conscious one of the teachers was about her use of humour in the class. The teachers' reflection on action (Schön, 1983) allowed me to elaborate on the analysis, outlining similarities and differences between the two teaching approaches. For example, the insights from the interview with the first teacher led me to ask more specific questions about the other teacher's view of humour in his teaching, where he had a different approach, which also enlightened new perspectives on the analysis. After discussing the preliminary analysis with the teachers, I turned to the literature again. Here, I integrated perspectives from a review of the use of humour in educational settings (Banas et al., 2011). Among others, the theoretical perspectives from the review made it possible to enhance my analysis of the use of humour in the teaching situations and develop new perspectives on the receivers and sources of the humorous

utterances proposed by others (Booth-Butterfield and Wanzer, 2010). The results of the analysis and further theoretical elaborations is presented in Paper 2.

As mentioned in the introduction, Dewey argues against a dualistic division between doing and thinking (Dewey, 1922). In fact, Dewey emphasises that: "*A separation of the active doing from the passive undergoing phase, destroys the vital meaning of practice"* (Dewey, 2007, p. 115). Dewey further elaborates that thinking is found when we wish to determine the significance of some act, performed or to be performed. In relation to the inquiry processes that I engage in during this research project, it can be argued that these stem from a wish to determine the significance of activities from practice – either performed or to be performed. In the role of an educational researcher, I have an interest in both understanding and developing practice, thus my interventions in the design experiments can be viewed as sometimes prospective and sometime reflective (Cobb et al., 2003, p. 10), which I will further concretise and elaborate in section 3.4. *Design-Based Research*.

When we as researchers develop solutions or an idea, we have to test it in practice by acting upon the idea. Here, Dewey argues that if the idea brings about certain consequences or changes in the world, it is accepted as valid (Dewey, 2007). From a pragmatic perspective, what brings rigor and scientific quality to small-scale projects is a disciplined and analytical awareness informed by theory (Brinkmann, 2012, p. 4). Thus, I have applied an abductive approach to reasoning (Brinkmann, 2012; Tavory and Timmermans, 2014) in the research process, where I move back and forth between empirical data and theoretical reflections. Thus, I take a point of departure in personal experiences reflected by theories. This approach is further elaborated in Chapter 6.

3.2. The connection between academic drawing and academic writing

In this section, I will try to elaborate how I use drawings as a central part of academic writing and how this way of imagining things on paper shapes the way I enter academic writing. From a pragmatic perspective, it has been an ongoing process of exploration throughout the research project and I consider the activity of writing to be a central part of the knowledge production. Among others, I will draw on Professor Graham Francis Badley's work (2015), who has a special interest in the development of PhD students and academics as writers. In his article 'Playful and Serious Adventures in academic writing', he argues for academic writing as 'trying an adventure' as a contrast to more theoretical approaches (Badley, 2015, p. 711). In his analysis of the writing process, he refers to Dewey's definition of "the ideal mental condition" for any inquirer as one being playful and serious at the same time (Dewey, 1991, p. 218 in Badley, 2015, p. 716). In line with this statement, I consider my approach to the academic materialisation as an explorative approach balancing the playfulness and seriousness of academic life. As Badley (2015) further elaborates, this adventure is not to be viewed as a counterattack to more theoretical approaches, but as a counterbalance that embraces the 'adventure of thought' in academic life.

Pragmatist Richard Rorty has previously admitted that he lacked original ideas himself, so he proceeded by putting bits of other scientists' work together, among others the work of Dewey. In this way, Rorty claimed that he had a 'talent for bricolage' (Knobe, 1995). As researchers in the 21st century, I would propose that this kind of bricolage is actually the most adequate way of doing research as we navigate the extensive knowledge available not only in books, but also in other kinds of visual media that our world surrounds us with (cf. Mirzoeff, 2009). If Rorty had lived today, I do not think that he would have to admit to 'a lack of original ideas'. On the contrary, he would possess the mindset of the

explorative inquirer who acknowledges the creative process of doing research by remixing materials (Tanggaard, 2020) as well as his own self-efficacy in doing the bricolage when something resonates with him (Rosa, 2019). Thus, I stand in line with other researchers (e.g. Meier and Wegener, 2018) by emphasising that we should actually *show* and *acknowledge* the messiness and detours in research, as I will argue: these are the places where 'adventures of thought' (Badley, 2015) can take place. And the detours, for me, start when something resonates with me. I will argue that this approach enables me – and possibly others – to *draw connections* between different empirical and theoretical materials, not just replicating other acknowledged academics, but acquiring my own personal voice in academia. As Brinkmann states: "*Qualitative researchers should think of themselves as craftspersons who engage creatively with the materials and should not be rigid methodologists who mechanically follow pre-defined steps*" (Brinkmann, 2012, p. 7).

As the title of this thesis indicates, my aim is to draw connections between different fields, for example between the design field and the humanities. Thus, I explore how to perceive myself as a researcher in this cross-disciplinary field. Former Rector of the Royal College of Art, Christopher Frayling (1993), describes how popular stereotypes of the difference between artists, designers and scientists have developed through history. As an opposite to the mad and expressive artist and the style-obsessed and trendy designer, the public image of the research scientist is one of an orderly and critical rationalist who "*has conjectures and hypotheses and he sets about proving and disproving them according to a set of orderly procedures*" (Frayling, 1993, p. 3). Frayling (1993) further argues that this image of an orderly and rigorous scientist has been undergoing a modification since the 1980s, as this image of "*research doesn't much resemble what science looks like in the laboratory, or what it feels like to those who are doing it*" (p. 3). I can relate to this feeling – that doing research seldom feels rational or orderly, which I will further elaborate in relation to the design-based research approach in section 3.4.2. To embrace the messiness of research and 'the adventure of thought' proposed by Badley (2015), I often use drawings in the elaboration phase where I try to connect my practice-based experiences to theories and to the work of others. Similarly, Causey (2017) states that he uses drawing to strengthen his ability to write about his observations afterwards. During my writing processes, I have tried to 'let my mind wonder' in different direction as suggested by Badley (2015), drawing connections between empirical data and theoretical perspectives. In Chapter 5, different examples of how I have used drawing as a part of my research and writing process is elaborated and in Chapter 8, I will let my mind wonder and suggest a framework for "The Drawing Connections Model".

From the EuViz conference 2018, I will emphasise an experience that reminds me to balance the playfulness and seriousness in academia. As part of the closing keynote with David Sibbet, where he were facilitating the mapping of visual facilitation practice (cf. section 1.8) a pink dinosaur interrupted – apparently – with a letter from David Sibbet's mother with the text: "*Why so serious*?". A playful atmosphere emerged and I remember laughter spread among us participants. There was an element of surprise and it was also funny, because you could see that David Sibbet was also not expecting this visit either during his keynote.

Figure 14: A pink dinosaur visiting the EuViz Conference, 2018

In a retrospective, it would have been interesting to ask the conference organisers about their designerly intentions of letting the pink dinosaur enter the stage. No matter the intention here, I can identify that this playfulness and not taken yourself too serious as a graphic facilitator is a theme across empirical data, which is also addressed and discussed in Paper 2.

3.3. Arts-based research as a pragmatic approach to inquiry

When I consider research as a type of craftsmanship that engages creatively with materials (Brinkmann, 2012), I have found inspiration in design approaches and Arts-based methods. Hansen and Dalsgaard (2012) emphasize that one of the primary tenets of pragmatism is the 'primacy of practice principle': "*which posits that theory and practice are not separate entities; rather, they are* ***intertwined****, as theories arise from practice and must be evaluated on the basis of how they scaffold our understanding of, and actions in practice*" (Hansen and Dalsgaard, 2012, p. 667, my emphasis). Hansen and Dalsgaard further elaborate how they see the production of material artefacts as a crucial part of knowledge creation (Hansen and Dalsgaard, 2012). The pragmatic approach can be linked to Arts-based Research (hereafter ABR), where different kinds of materializations, e.g. literary writing, music, dance, performance, visual arts and film, and other media are being included in research practice. Leavy describes ABR practices as follows: "*ABR practices are a set of methodological tools used by researchers across disciplines during any or all phases of research, including data generation, analysis, interpretation, and representation. These emerging tools adapt the tenets of the creative arts in order to address research questions in holistic and engaged ways in which theory and practice are* ***intertwined***" (Leavy, 2020, p. 4, my emphasis). Leavy further argues that every ABR tool has a 'representational form' which can vary in materiality, but *drawing* is mentioned as one of the representational forms.

As part of exploring the field of graphic and visual facilitation and the connection to the design field and ABR practices, it becomes interesting to explore the intertwined relationship between practice and theory. Can the representational form of drawing support this knowledge creation and presentation? In Chapter 5, I will describe and analyse the different uses of visual methods in the

research project by showing concrete examples from the research process. But first I will present Design-based Research as an overall approach to conducting the research project.

3.4. Design-Based Research

Design-based research (hereafter DBR) is an approach to research which focuses on both understanding and developing learning environments (Barab and Squire, 2004). Design-based research evolved at the beginning of the 21st century and the use of the research approach has increased over the last decades (Anderson and Shattuck, 2012, Gundersen, 2021). DBR researchers advocate for the method's applicability in educational research in both improving practice as well as the importance of theory building: "*DBR is a methodology designed by and for educators that seeks to increase the impact, transfer, and translation of education research into improved practice. In addition, it stresses the need for theory building and the development of design principles that guide, inform, and improve both practice and research in educational contexts*" (Anderson and Shattuck, 2012, p. 1).

One of the founders of Design-based research, Ann Brown (1992), argues for the use of design experiments to investigate learning in more natural settings as opposed to prior lab experiments only focusing on cognitive aspects of learning. A fundamental assumption of many learning scientists within DBR is that cognition is not a thing located within the individual thinker but a process that is distributed across knowers, the environment in which knowing occurs, and the activity in which the learners participate (Barab and Squire, 2004). In this research project, it is essential to clarify the participants, the contexts of doing graphic and visual facilitation and the activities that constitute the learning environments. Likewise, it is relevant to clarify the role of the teachers and researchers when doing design experiments.

3.4.1. Central aspects in DBR projects

In this section, I will present central aspects in Design-based research concerning the role of participants and the roles of teachers and researchers. Furthermore, I will reflect on my own role as teacher, designer and researcher in the PhD project.

Participants' roles

In her studies, Brown (1992) argues for creating a 'community of learners' which also affects how the teaching is organized. She advocates that we need to challenge traditional arrangements of classrooms where "*students are perceived as relatively passive receivers of wisdom dispensed from teachers, textbooks, or other media*" (Brown, 1992, p. 149). Brown further argues for what she calls an 'intentional learning environment' where students are encouraged to engage in self-directed learning and critical inquiry. Thus, she compares the students' work to the work of researchers: "*They [the students] act as researchers responsible to some extent for defining their own expertise*" (Brown, 1992, pp. 149-150). I see a connection between this understanding of the students' roles and the pragmatic perspectives and principles within PBL, which are illuminated and analysed in Paper 4. In this paper, the students' role as a designer entering inquiry processes is investigated, which can be related to the work of researchers as proposed by Brown (1992) and previously elaborated by Frayling (1993). In recent research, we also see argumentation for perceiving learning environments in education as 'communities of creation' (Brinkmann and Tanggaard, 2013, p. 245). As Brown did in the 1990s, the researchers also advocate for a break with traditional ways of perceiving learning where students are

placed as passive spectators of teaching by an omniscient teacher, a tradition that they name 'the epistemology of the eye' (Brinkmann and Tanggaard, 2013, p. 245). Contrary to the traditional view of learning, the researchers advocate for learning environments based on the 'epistemology of the hand' and pragmatic perspectives on craftsmanship and active engagement in subjects and manufactured knowledge, literally 'made by hand' (Brinkmann and Tanggaard, 2013, p. 253). I will argue for establishing a connection between these ways of perceiving learning as craftsmanship 'made by hand' and the introduction of visual methods to students to enable them to investigate the productive role of the materials in their group processes. Thus, my hypothesis is that the visual methods can provide an operationalization of pragmatic inquiry perspectives. The investigation of the interaction between the pragmatic inquiry processes, design theory and visual methods is elaborated in Papers 4, 5 and 6 concerning the design experiments in the research project. In each paper, the student group, specialisation and course is described and analysed in relation to the teaching activities in order to explore the collaborative knowledge production in these learning environments (Barab and Squire, 2004). Furthermore, the teachers' roles as designers are also elaborated in Papers 4, 5 and 6 and in the section below.

The teacher's role

When students are encouraged to engage in self-directed learning and critical inquiry processes, the role of the teacher changes accordingly. Brown (1992) argues that "*Teachers' roles also change dramatically in that they are expected to serve as* ***active role models*** *of learning and as responsive guides to students' inquiry processes*" (p. 150, my emphasis). Brown further argues that this way of perceiving teaching requires a teacher that is responsive to students' needs in the situations rather than entirely focused on fixed scopes, schedules or lesson plans.

The assumption about the students' roles as researchers and inquirers is significantly related to the ways in which I conducted the design experiments in this study. Thus, I consider the different visual methods that I use in my own research processes as potential ways for students to work to support their research and inquiry processes. Therefore, I consider myself to go into a *joint inquiry* process together with the students (see also Paper 4), showing concrete examples of e.g. context investigation and the development from early sketches to presentation drawings. Moreover, I prioritise taking an active part in providing a role model for using drawing in academic practices, see Paper 5 section 2.2 *The teacher as a role model for 'actually' drawing* (Hautopp and Buhl, 2021, p.325). Here, the pragmatic view of knowledge is emphasised; hence it is not just the verbal and theoretical arguments for the use of drawing in academic practice that mattered, but also the actual practical activity of drawing that was shown and repeated as well as developed in relation to the learning context of the students. Dewey was known for "*practicing what he preached*" (Nussbaum, 2016, p.85) when organising teaching in his Laboratory School, where he refused abstract learning uncoupled practice. Without any further comparison with Dewey's revolutionary educational work, my humble suggestion is that we as teachers 'practice what we preach' to invite students into inquiry processes reflecting theory coupled to concrete experiences. In this research project, meaning that I showed my own process of drawing and reflecting theories as part of the teaching to exemplify the materialisation of inquiry processes (Hansen and Dalsgaard, 2012). Concrete examples of how I explored the use of drawings in the development of educational designs will be elaborated in section 5.3.

The researcher's role

As mentioned in the introduction, education research is an applied field, and learning scientists bring agendas to their work (Barab and Squire, 2004, p. 2). My agenda for the research project has developed since the first time I became acquainted with graphic facilitation and my agenda is that graphic and visual facilitation *can* be used as an academic method, but there is a need for empirical research on the implication of the method in local contexts. Thus, I argue that design experiments in natural settings (Brown, 1992) can provide a context for exploring the potentials and barriers of introducing graphic and visual facilitation into higher education focusing on students' design exploration.

Barab and Squire (2004) further argue that challenge in carrying out design-based research arises from the joint role of the researcher as *designer* and *researcher*. The authors further explain this challenge: "*Design-based researchers are not simply observing interactions but are actually 'causing' the very same interactions they are making claims about*" (Barab and Squire, 2004, p. 9). To add to the complexity of the joint role in the research project, I also played the role of *teacher* in the design experiments. Thus, I played an active role in all phases of the design experiments: preparing, carrying out and conducting a retrospective analysis (Cobb et al., 2003). It can be argued that I might have taken an action research approach to the design experiments, as this approach shares common features with design-based research. Both approaches share pragmatic perspectives and feature applied research agendas (Andersson and Shattuck, 2012). These similarities also cause researchers and practitioners to have trouble differentiating between action research and DBR (Andersson and Shattuck, 2012). The researchers further elaborate a difference where "*action research is normally carried on by the teacher alone, thus not benefitting from the expertise and energy of a research and design team that characterizes DBR*" (Andersson and Shattuck, 2012, p. 17). When I chose to place my research within the DBR tradition, I prioritise the collaborative aspect of the educational research, which will be further addressed in Chapter 4. Thus, I consider my arrangement of design experiments to be highly dependent on the collaborative effort and expertise of my colleagues, whom I considered to be part of my 'design team', as named by Andersson and Shattuck (2012). As further described in Paper 6, I was invited to be a teacher on the course 'Communication Design: Experiences, Time, and Space', with a "*specific focus on teaching practical tools such as sketching and visual facilitation related to the students' task of developing communication designs. Moreover, relating the practical tools to pragmatic inquiry approaches, sketching theory, and the overall context of the course*" (Hautopp, 2021, pp. 6909-6910). With a similar purpose, I was invited to be responsible for the same teaching activities in the design experiment conducted in Paper 5 and another design experiment conducted together with colleagues, where we explored the combination of audio-creative methods in higher education (Ørngreen, Henningsen and Hautopp, 2021).

Thus, inviting my expertise in graphic and visual facilitation to the courses, can be seen as a development of the courses with an expectation that this supplement could enhance the students' design explorations targeting different subjects. This research project aims to explore the implications of teaching these visual methods on the different courses. Based on Creswell (2012), it can be emphasised that action researchers also operate in teams investigating specific issues and solutions in local contexts (p. 577), a description which could be argued to reflect my research design as well. However, while aiming to draw connections between organisational and higher educational contexts, I also investigated teaching practices which were not carried out by me. Thus, I engaged in a study outside my own teaching practice in higher education. As mentioned, in DBR research there is a focus

on improving practice and an explicit demand for theory building and the development of design principles that guide, inform, and improve both practice and research in educational contexts (Anderson and Shattuck, 2012). I will address this need in the next section.

3.4.2. The structure of the DBR phases in the research project

In this section, I will present the overall structure of how I have organised the research project. I have found inspiration in Christensen et al. (2012), who suggests four different phases when doing DBR projects: *Context*, *Lab*, *Intervention* and *Reflection* (pp. 10-11). These phases overlap, but address different central aspects of the research process:

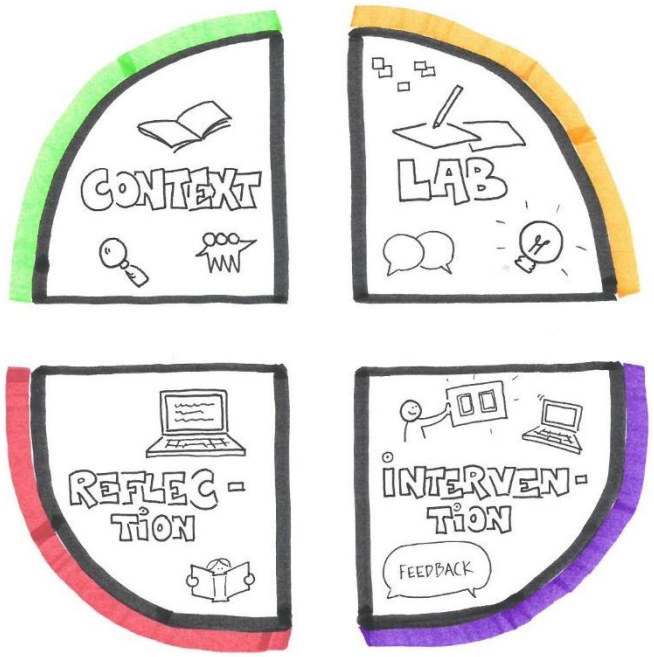


Figure 15: Design-based research phases – my own visualisation inspired by ELYK innovation model (Christensen et al., 2012, p. 11)

Below the four phases are briefly listed, and will be elaborated further:

1. **Context phase:** Domain research e.g. through literature review and fieldwork
2. **Lab phase:** Development of educational designs e.g. through design framework and prototyping
3. **Intervention phase:** Test of educational design in practice involving analysis and redesign in iterative processes
4. **Reflection phase:** Documentation of results, theory generation and reporting

I use this model to illustrate the different kinds of phases I have been engaged in during the research project. The phases are viewed as the overall research approach to the PhD project and each paper primarily targets empirical data from the different phases (see figure 39 in Chapter 7. *Presentation of Papers*).

In the following, I will introduce the methodological perspectives, which I draw inspiration from in each of the phases. A further elaboration of the context description and empirical data is presented in Chapter 4.

1. Context phase

As a central part of Design-based research, it is crucial to examine the *context* in order to target interventions (Anderson and Shattuck, 2012). DBR researchers emphasise that *context matters*, and advocate for a rich description of the natural settings where a social phenomenon is being investigated (e.g. Barab and Squire, 2004, p. 1). By examining the contexts, it becomes possible for me to identify potential for development of learning environments through design experiments (Christensen et. al., 2012). In Chapter 4, the organisational and higher educational contexts of the study are elaborated and the concrete contexts of data collections are presented. In the following section, I will illuminate selected perspectives from qualitative research and relate them to the methodological approaches to investigating the contexts. The methods are also illuminated in each paper. Below I will present perspectives on literature review, ethnographic fieldwork and participatory observation, interviews and photo elicitation.

Literature review

Reviewing the literature means locating books, journals and publications on the topic, selectively choosing which literature to include in the review and then summarizing the findings (Creswell, 2012, p. 9). As part of the initial context investigation, I conducted a literature review together with my supervisor, Rikke Ørngreen. In the literature review, we took a point of departure in the terms *graphic facilitation* and *graphic facilitator* (see further description in Paper 1). Creswell argues that in qualitative research "*the literature might yield little information about the phenomenon of the study, and you need to learn more from participants through exploration*" (Creswell, 2012, p. 16). In line with Creswell's argumentation, the literature review justified the need to study graphic facilitation and as the paper will show, it outlined a need for more empirically based research on the perspectives of participants engaging in graphic facilitation practices.

I perceive 'participants' as an overall category for the people who have participated in the research project. These include graphic *facilitators* – from newcomers to professionals facilitating meetings, and *learners* – from employees to students participating in graphic facilitation courses, and *teachers* – from graphic facilitators to university teachers teaching visual and designerly ways of working. In each paper, different terms are used in relation to the specific context of investigation. For example, in Paper 2, the term *teachers* is used about professional graphic facilitators in their specific teachers' role in this ethnographic study. Likewise, the term *trainees* is used in Paper 3 to describe employees in their roles first as participants in a basic graphic facilitation course and their subsequent role as newcomers applying graphic facilitation in their daily work practices. In Paper 6, the term *examiner* is used to describe a participating university teacher who has performed both roles as teacher and examiner on a course, but afterwards was interviewed in relation to her role as an examiner, discussing the students' actions in the exam situations.

Ethnographic fieldwork and participatory observations

To learn about participants' perspectives on graphic facilitation, I engaged in different kinds of ethnographic fieldwork and participatory observations. Van Maanen (2010a) describes that a researcher becomes an ethnographer by actually going out and doing fieldwork and writing it up afterwards. As mentioned in the introduction, I see myself as a traveller who 'goes out' into the field of graphic and visual facilitation and 'does fieldwork and writes it up afterwards'. Van Maanen outlines a tendency that "*ethnography is no longer confined to single-site studies of supposedly isolated or conveniently distinct and isolated peoples*" (Van Maanen, 2010a, p. 10). He highlights multi-site fieldwork where ethnographic studies "*differ in terms of working style, place, pace, time and evidentiary approaches*" to capture current tendencies in ethnographic work (Van Maanen, 2010a, p. 6). Thus, many researchers who undertake fieldwork explore different ways of engaging in the field as well as documenting their engagement. As part of my ethnographic fieldwork, I also did self observations (Brinkmann, 2012) as I took an active part in the field as teacher, designer and researcher. Brinkmann argues, that our everyday world can only be known 'from within' by a participating self (Brinkmann, 2012, p.67). Thus, my understanding of the use of graphic and visual facilitation steams from my practical interference with the field. When doing self observation, it is also relevant to make clear what I wanted to observe (Brinkmann, 2012, p. 67). Besides observing the learning environment revolving graphic and visual facilitation to support students' design exploration, it is crucial for me to examine my own influence as a teacher in these settings. In the Papers 4, 5 and 6, theoretical reflection on the teacher's role is presented and in section 5.2. I elaborate on my own didactical considerations as a focus point for my self observations. In line with Van Maanen (2010a) Brinkmann point to a tendency of incorporating various creative approaches when documenting self observations in diaries and journals (Brinkmann, 2012, p.78-80) and below, I will elaborate on how I organised my fieldwork and self observations.

In line with the tendencies within ethnographic fieldwork and self observations, I have explored different ways of combining my own experiences from the field with other qualitative methods. Here, I have been inspired by the work of artist and ethnographer, Andrey Causey (2017), who advocates for the use of drawing when doing ethnographic fieldwork. Even though Causey is a passionate advocate for drawing to be an acknowledged way of conducting fieldwork, he still perceives it as a 'risk of dare', because it challenges previous traditions in the ethnographic field based on the writing of thick descriptions (e.g. Causey, 2017, p. 29). However, Causey calls it a *fascinating risk* when we dare to draw as a crucial part of doing ethnographic fieldwork. He elaborates: "*You are, in fact daring yourself to perceive the world in a new way when doing your ethnographic research, and in taking that small risk you might find out something unexpected, remarkable, or even revolutionary*. *When you use pencil and paper to help you see, you are claiming the fundamental right to represent the world around you imagistically*" (Causey, 2017, p. 49).

For me, the use of drawing as part of the research approach provides me with a tool to include a personal dimension in my research (Brinkmann, 2012). I have used a combination of drawings and written notes, somewhat similar to doing graphic facilitation when combining words and drawings (Nielsen et al., 2016). I have used them particularly, when participating in conferences, participatory observations of graphic facilitation courses and at other events, such as PhD courses. I have around 25 notebooks filled with hand-drawn/written observations and notes from the last four years of doing the research. Selected drawings will be shown as examples in Chapter 5.

Interviews and photo elicitation

As part of my context investigation, I interviewed graphic and visual facilitators from professionals to trainees at basic graphic facilitation courses. The purpose was to gain insights into their experiences of graphic and visual facilitation from both a teachers' and participants' perspective. To situate the interviews in concrete contexts (also described in Papers 2 and 3), I used elicitation methods to ground the experiences (Wang, 1999; Harper, 2002) and asked the participants to bring photos of drawings or the concrete drawings from 'a typical situation from their daily work where they have used graphic facilitation'. Or I brought my own annotated drawings to the interview, asking the participants to elaborate on my own preliminary analysis, e.g. as arranged in Paper 2 (see figure 16, 1A).

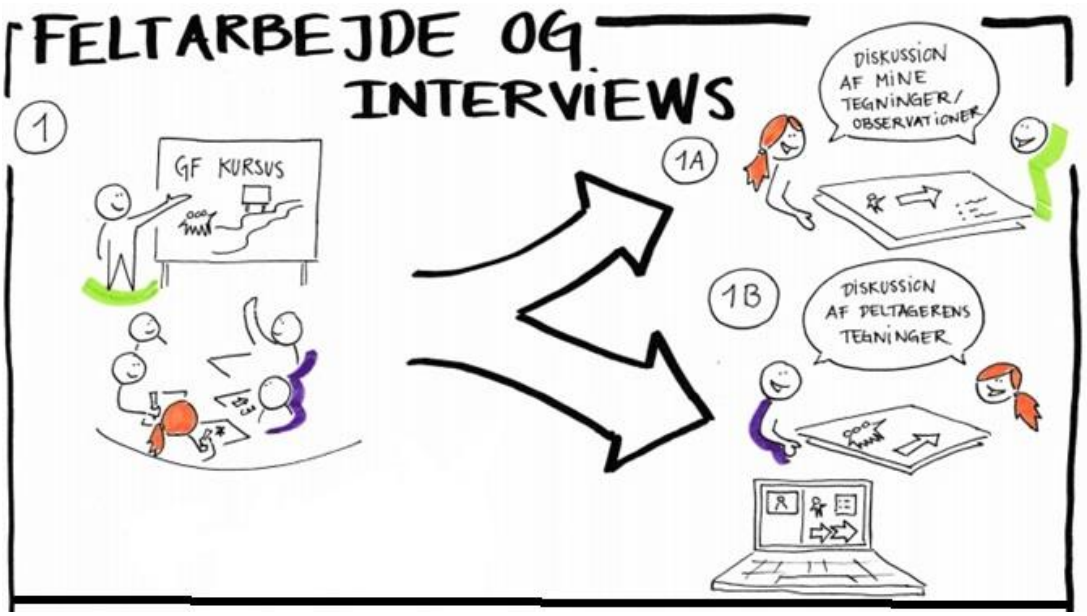


Figure 16: Visual presentation of the relation between fieldwork (left) and the interviews conducted afterwards (right)

The visual presentation in figure 16 shows the connection between the fieldwork and participatory observations at a basic course in graphic facilitation (1) and the interviews conducted with teachers (1A), see further description Paper 2, and interviews conducted with participants (1B), see further description in Paper 3. From the concrete visual examples, the interviews unfolded as semi-structured interviews. Brinkmann describes how: "*semi-structured interviews are planned, yet flexible, interviews with the purpose of obtaining descriptions of specific experiences of the interviewees, and which normally aim for some interpretation of the meaning of the described phenomena*" (Brinkmann, 2012, p. 85). From a pragmatic perspective, the aim of the interviews was to provide a space for the graphic and visual practitioners to describe specific experiences of graphic facilitation rooted in their daily work in order to get insights into how they perceive their own practice. Thus, I strived to create a flexible framing of the interview situation with open-ended questions for the participants to engage in (Creswell, 2012). A theoretical perspective on the interview situation and a view on the participants as reflective practitioners (Schön, 1983) is elaborated in Chapter 6.

Teaching observation

It can be argued that the abovementioned examples of methods are primarily targeting investigation of the organisational context. However, I have used similar approaches when preparing a design experiment in each local context (Cobb et al., 2003). For example, when framing the context of the course in Paper 6, we built upon a collaboration with an art gallery as an external stakeholder. Thus, in each intervention, we as teachers negotiate a challenge that meets the current exhibition goals and needs and also the learning goals of the course. As students are prompted to take a DBR approach to their design processes, we start by visiting the art gallery/museum as a part of their knowledge investigation. When we are at the location, I use drawings as a way to capture my ethnographic fieldwork (Causey, 2017), which I share in the teaching as examples afterwards (see further description in Chapter 5). Thus, I investigate the same context for which the students should design, which is also the same context for which I should teach. Furthermore, in 'our design team', each year we evaluate the specific course and adjust the course in relation to the students' evaluations as well as to our own teaching observations.

2. Lab phase

According to Cobb et al. (2003), conducting educational research design revolves around *preparing for and carrying out* a design experiment and *conducting a retrospective analysis* of the extensive, longitudinal datasets generated during an experiment (p. 9). The lab phase is characterised as a *preparation* phase, where the educational design is developed based on domain-specific theories and the design framework (Christensen et al., 2012). Anderson and Shattuck (2012) argued for detailed documentation of the creation and implementation of a design experiment so that the readers can judge for themselves the possibility of achieving similar – or even better – results from the use of this intervention in their own contexts (p. 16). In Papers 4, 5 and 6 as well as section 5.2., I have prioritised a rich description of the design and the results of its implementation to provide insight into the local dynamics (Barab and Squire, 2004) of the course and the didactical considerations regarding the design and re-design of the experiments.

As mentioned, my research project was carried out in collaboration with colleagues. These collaborations are further described in Chapter 4. Cobb et al. (2003) described how design experiments can vary in size, e.g., one-on-one experiments with a small number of participants can create a small-scale version of a learning environment that can be studied in detail. My first workshop with colleagues, held in 2015, was a small-scale version of a teaching setting with a focus on the combination of graphic facilitation and design sketching. I also conducted experiments with visual practitioners in the field, e.g., Ia Brix Ohmann, back in 2019.

Figure 17: A one-on-one experiment regarding the use of a document camera conducted together with visual practitioner

We had a shared interest in implementing the document camera in our work practice. Ohmann's interest was in relation to facilitating an international webinar and other visual facilitation tasks, and I was interested in exploring the distribution of drawings between campuses in higher education (as further described in Paper 5). Based on our experimentation in practice, we discussed functionalities as well as didactical considerations when using the document camera to distribute visual content across locations. Through the experimentation during the lab phase, I was able to gain knowledge on a specific aspect of the design experiments, here exemplified with the document camera (see further description in Paper 6).

3. Intervention phase

This section addresses how I worked with the design and redesign of interventions throughout the research project. During the intervention phase, the educational design is applied in a natural context to study the variable that characterises this context (Christensen et al., 2012). The application of the design experiments in this research project is shown in Papers 4, 5 and 6. In design experiments, complexity is of the essence (Barab and Squire, 2004). Thus, it is relevant to identify what is at the foreground and the background in each design experiment (Cobb et al., 2003, p. 10). Therefore, different foci were addressed in the three design experiments in this research project. The context and focus of each design experiment is further described in the papers and in Chapter 5.

Design experiments always have two facets – prospective and reflective (Cobb et al. 2003) – where the prospective revolves around creating *design principles* to guide the design intervention (Anderson and Shattuck, 2012). In a previous DBR project, I struggled with the formulation of design principles. In a meta-study of DBR, Gundersen (2021) pointed out the challenge that in the DBR literature, design principles are often vaguely described or not used in a systematic way, with researchers revisiting and redesigning the principles alongside the iterative development of their interventions. When conducting qualitative interviews with DBR researchers, Gundersen found that researchers emphasised uneasiness with generating abstract best practices based on highly situated experiments and that the knowledge they produced was not prescriptive in nature. Gundersen (2021) summarised: "*According to the researchers, principles are too bold or not cut for the kind of knowledge they produce*" (p. 9). As mentioned prior with a reference to Frayling (1993), I agree that research processes do not follow strict plans in which a set of hypotheses are either proven or disproven in practice. Thus, the abovementioned researchers' claims about principles being too bold and not appropriate for the kind of knowledge produced in DBR projects resonates with my understanding of educational research.

I now address the overall assumptions proposed earlier in this dissertation, which guided my design experiments. As mentioned in Chapter 2, I proposed an assumption that graphic and visual facilitation might be a drawing practice that can be related to students' practices within the humanities when they are developing learning and communication designs. Furthermore, in this chapter, I have outlined a hypothesis that visual methods can provide an operationalization of pragmatic inquiry perspectives. Thus, the development of the design (referred to as 'educational design' or 'pedagogical intervention' in the Papers) rests on the working hypothesis that: *a combination of graphic and visual facilitation and sketching can provide an operationalisation of pragmatic inquiry perspectives for humanities students to enter design exploration in higher education.*

The abovementioned assumptions provided the direction for the design experiments, in which I explored different framings and reframings (Goffman, 1974) of drawing exercises, roles, analogue and digital materialities, etc. targeted for each design experiment. These experiments were informed by prior iterations and knowledge derived from investigating the organisational context. When conducting design experiments, there is often a tension between the intended design and the participants' response to the design. Thus, educational researchers argued that the design must be understood and developed in relation to the response of the participants (Andreasen, Meyer and Rattleif, 2008, p. 11). In line with this argument, the design experiments for this research project were designed and redesigned based on the students' responses to the design and in relation to the specific context of the designs. Frayling (1993, p.3) argued that research "*involves irrationality, craftsmanship knowledge and negotiation with reality rather than hypothesising about it*", which echoes my research approach to negotiating with the contexts, which led to further exploration.

4. Reflection phase

The fourth phase of DBR research revolves around reflective processes and *conducting a retrospective analysis* of the extensive, longitudinal datasets generated during an experiment (Cobb et al., 2003, p. 9). In the design experiments, we collected various different types of data: teaching observations, interviews with student groups, observations of students' exams, students' oral and written evaluations of courses, as well as students' visualisations and video productions. These empirical data laid the foundation for the analysis, which targeted different design experiments and contexts.

As mentioned, a significant element in DBR is the focus on theory building (Cobb et al., 2003; Barab and Squire, 2004; Anderson and Shattuck, 2012; Gundersen, 2021). Barab and Squire (2004) emphasised that an important requirement for DBR researchers is to produce both demonstrable practical changes at the local level as well as the advancement of theory. They further elaborated: "*Design-based research that advances theory but does not demonstrate the value of the design in creating an impact on learning in the local context of study has not adequately justified the value of the theory*" (Barab and Squire, 2004, p. 6). Thus, the pragmatic understanding of theory building becomes evident when theoretically reflected ideas are validated in relation to their consequences and the changes they provide in practice (Dewey, 2007). Therefore, I aim to be transparent about my practice-based and theoretically reflected design decisions regarding the development and redesign of the educational design tested in the design experiments. Furthermore, a *retrospective analysis* of the design experiments is theoretically discussed in each of the three design experiments in Papers 4, 5 and 6. In those Papers, we aimed to illuminate examples of teaching activities with rich verbal and visual descriptions to enable other teachers and educational researchers to critically examine the practical implications and potentials of implementing similar design experiments in their own contexts

(Barab and Squire, 2004; Anderson and Shattuck, 2012). In Chapter 9. *Conclusion - connecting the Lines*, the practical implications and knowledge contribution (Creswell, 2012) across the papers is summarised.

3.4.3. The twofold function of the Design-Based Research

The first part of Chapter 3 have revolved around my own approach to the research design where I have focused on pragmatic inquiry processes organised as a Design-based research project. Besides function as an overall approach to the PhD project, each design experiment also follows a DBR approach. For example, the design experiments described and analysed in Paper 5 is a redesign of an earlier intervention (Buhl, 2018). In the re-design experiment in Paper 5, two drawing workshops were added with a specific focus on introducing sketching and visual facilitation for students to use and reflect on their design exploration (see further description and analysis in Paper 5). This led to another function of the DBR model as it also introduced a way for the students to work through the different design research phases (e.g. Barab and Squire, 2004; Christensen, 2012).

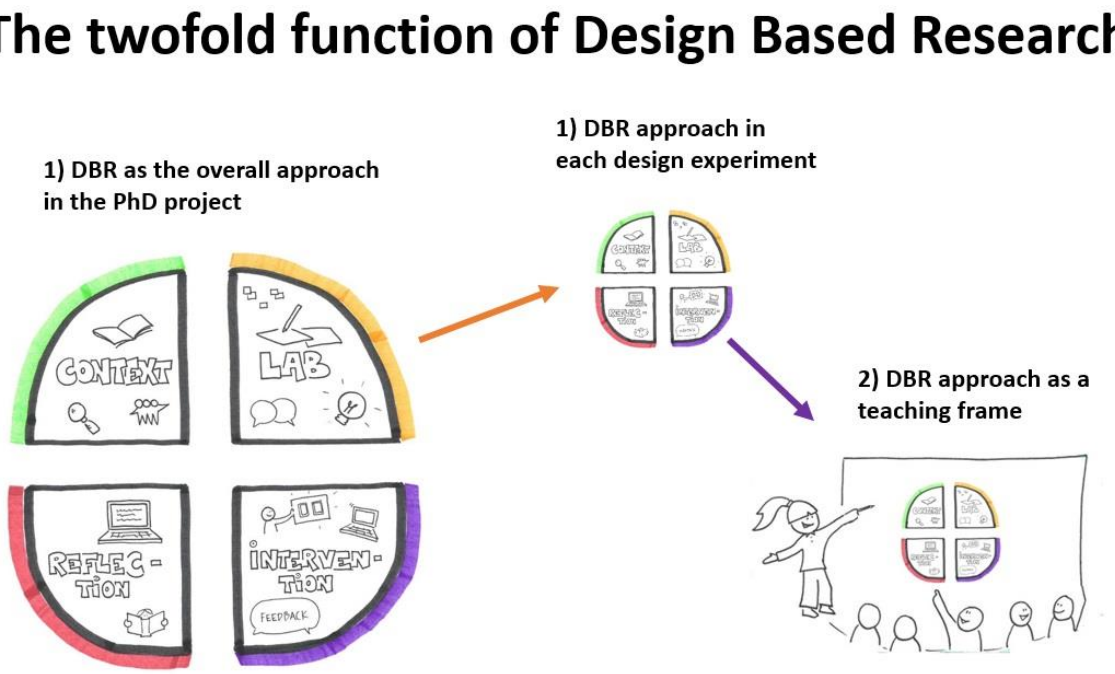


Figure 18: Visual presentation of the twofold function of Design-Based Research

Figure 18 shows how the DBR approach was used as 1) the overall approach in the PhD project and in each design experiment and 2) as a teaching frame in each design experiment, also encouraging the students to take a combined role as researchers and designers (Brown, 1992; Frayling, 1993). Thus, DBR functions both as a research approach for me as the educational researcher, and as a teaching frame in the design experiments prompting the students to work as e.g. learning designers. In a meta-perspective on higher education, it makes sense to be explicit about the twofold function of DBR in the design experiments. In Danish University Law (in Danish: Universitetsloven) it is emphasised that the university has, among other things, the obligation to "*provide research-based education*" and to "*distribute knowledge about scientific methods*" (Universitetsloven, 2022, Purpose, paragraph 2). As

an educational researcher, I perceive it as my obligation to provide students with different theoretical and methodological tools with which to engage in scientific practice as a central part of their academic education. In this research project, the scope is an exploration of the use of graphic and visual facilitation as academic tools.

Design-Based Research is not so much *an* approach as it is a series of approaches, with the intent of producing new theories, artefacts, and practices that account for and potentially impact learning and teaching in naturalistic settings (Barab and Squire, 2004, p. 1). The approach in the research project is informed by and developed with inspiration from different design research approaches and art-based research, including visual methods. After I have presented the contexts and empirical foundation of the research project in Chapter 4, examples of the use of visual methods in higher education is further elaborated in the Chapter 5.

Chapter 4: Context description and empirical foundation

As mentioned, DBR researchers emphasise that *context matters,* and advocate for a rich description of the natural settings in which a social phenomenon is being investigated (e.g. Barab and Squire, 2004, p. 1). Thus, in the following I will describe what constituted the two different contexts of the PhD project: an *organisational context* and a *higher educational context*. In relation to my DBR approach to the research project, some of the investigations are primarily part of the context phase (Papers 1, 2, 3) whereas other explorations are primarily part of the lab and intervention phase of the DBR approach (Papers 4, 5, 6). The context descriptions consists of both elaboration of the empirical data and theoretical reflections, where I aim to draw connections between graphic and visual facilitation, meeting culture and PBL group processes within humanities. The purpose is to place the research project in relation to current discourses within the two contexts (Brinkmann, 2012).

4.1. Elaboration of the organisational context

In this section, I present the empirical data derived from the organisational context. Afterwards, I theoretically reflect on the meeting culture of organisations and how the discourses within graphic and visual facilitation tap into the discourses within meeting culture.

Empirical foundation in the organisational context

As part of the context phase investigating *"How is graphic facilitation being practised?",* I conducted literature review, ethnographic fieldwork and interview with participants. Besides doing a literature review (Paper 1), I also followed both professional practitioners and novices using graphic facilitation in organisational contexts. Below I will present the primary empirical data of my investigation of the context, which are further described and analysed in Papers 1, 2 and 3. The focus of the investigation of organisational context, was on the role of the facilitator when teaching graphic facilitation (Paper 2) and long-term perspectives on using graphic facilitation in organisational contexts (Paper 3).

Below the primary empirical foundation of the organisational context is listed and described:

- **Literature review (2018):** In the beginning of the research project, I conducted a literature review within the field together with my supervisor, Rikke Ørngreen (Paper 1). We conducted a systematic literature review search using Harzing's Publish and Perish software (Harzing, 2010: 135–146) and employed the queries: "*graphic facilitation*" OR "*graphic facilitator*" for the period 1988 to 2018. To qualify for the review, we added a backward and forward snowballing approach (Wohlin, 2014), investigating which references are used in the much-cited literature and then conducting a search of who else has used the same references. Some publication felt out of scope as we systematically worked through the complete list and paid particular attention to papers, that have been cited more than 50 times. These are presented and related to other research areas in particular design sketching, social learning theories and problem-based learning (Paper 1). The literature review have laid the direction for the rest of the research project in order to draw connections between different fields and academic disciplines.

- **Ethnographic fieldwork following two professional graphic facilitators' teaching of basic courses and follow-up interviews (2018-2019):** I followed two different graphic facilitators teaching two 2-3-day basic courses in graphic facilitation for 10-12 participants. Both courses were offered by Danish labour unions who had hired a graphic facilitator to give an open course for their union members. Thus, the participants on the course came from different companies looking for new visual methods and tools to use in their daily profession. The purpose of the basic courses was to teach graphic facilitation as a method for participants to apply in their own work and make the participants reflect on how they could relate the method to their own context. After conducting ethnographic fieldwork and participatory observation, I did follow-up interviews with the teachers. This ethnographic study provided me insights into the didactical considerations of the teachers, when teaching graphic and visual facilitation to employees from different organisations (see Paper 2).
- **Long-term perspective interviewing three participants who attended a basic course in graphic facilitation – two interviews with each participant over a two-year period (2018-2020):** The point of departure for this investigation was a 2-day basic course held by a Danish consultancy company with an expertise in graphic facilitation in collaboration with a Danish labour union. The participants were members of the labour union and signed up voluntarily to gain insights and new skills within graphic facilitation. The participants came from different public organisations as well as private companies. The empirical data of this study includes participatory observations made during the 2-day basic course in graphic facilitation and interviews with three participants respectively 8 months and two years after completing the course. Together with my supervisor Rikke Ørngreen, I have analysed and discussed the results from the interviews in relation to a literature review on effect, value and impact within graphic and visual facilitation. This study provided insights on the long-term perspectives of using graphic and visual facilitation in organisations (see Paper 3).

Below the secondary empirical foundation is listed and briefly described:

- **Participation in the European conference for Visual practitioners (EuViz), 2018 (August 2018):** The conference was organised in a collaboration between EuViz and IFVP – International Forum for Visual Practitioners (https://ifvp.org/). The three-day conference was held at Rungstedgaard in Denmark and the programme consisted of keynotes, workshops, formal and informal meetings. Furthermore, an open-space session was arranged, where all participants could propose a subject or issue they cherish and would like to discuss with others (Treinen et al., 2015). Participation in this conference has laid a foundation for investigating the emergence of terms, e.g. graphic and visual facilitation (Introduction and Chapter 2), as well as having provided contacts to graphic and visual facilitators who have participated in the research project.
- **Workshop with graphic facilitators – exploration and development of analogue and digital possibilities within graphic facilitation practices (2018):** The workshop was held in collaboration with associate professor in strategic design, Peter Vistisen, where we invited graphic and visual facilitators to discuss digital possibilities within the field. Four professional facilitators with different levels of experience within the field participated. The workshop provided knowledge about the current digital practice within graphic and visual facilitation among the participants in 2018, which is a topic that needs further investigation due to the

online re-organisation of practices during the COVID-19 pandemic. Insights from the workshop are presented especially in Chapter 2 in relation to discussing digital possibilities and barriers in graphic and visual facilitation.

- **Interviews with seven professional graphic facilitators (2018–2019):** Interviews with graphic and visual facilitators with different backgrounds, e.g. as illustrators/artists or as teachers/facilitators. A common experience for the group was that they have come to use graphic and visual facilitation as part of their professional work. Insights from the interviews are especially presented in Chapter 2 in relation to discussing digital possibilities and barriers in graphic and visual facilitation and in relation to the vocabulary used within the field.
- **Participation in local networks for graphic facilitators in Denmark – in Copenhagen and Aalborg (2018–2022):** At the EuViz conference in 2018, the idea of making a national network for visual practitioners was born. Shortly after the conference, Ia Brix Ohmann and Mia Pallisgaard initiated a network for visual practitioners in the area of Copenhagen, where participants could share ideas and experiences at face-to-face meetings and in a Facebook group. In 2019, Jakob Storm Bruun was inspired by the network, and initiated a similar network in Northern Jutland. With my affiliation with Aalborg University, I have participated in both networks. Participation in the networks has provided insights into the expanding field in Denmark and has also allowed me to share and discuss my research with experienced practitioners from the field.
- **Participation in graphic facilitation courses (f2f/online):** Participation in graphic facilitation courses held both on location and online gave me insights into the different ways in which teachers facilitated courses. Likewise, it provided inspiration for different ways in which to facilitate workshops in graphic and visual facilitation in higher education.
- **Two free-hand drawing courses (2020) at Copenhagen Art School and a folk high school in Copenhagen:** Participation at these courses gave me valuable insight into the drawing practice related to the design and architect fields. This was valuable knowledge for gaining practice-based experience (Brinkmann, 2012) in the similarities and differences between the drawing practices in design/architecture and graphic/visual facilitation.

Theoretical reflections on the organisational context

As introduced in Paper 6, a large focus on visual culture has emerged over the last decades (Mirzoeff, 2009), challenging the traditional privilege of written and oral language in education (Bowen and Evans, 2015). Professor in Media, Culture and Communication, Nicholas Mirzoeff (2009), emphasises that the concept of "*visual culture reminds us that there is no such thing as a visual medium because all media are necessarily mixed*" (p. 1). Furthermore, Mirzoeff describes how we live in a world saturated with screens, images and objects, all demanding our attention. Now, perhaps more than ever, in a visually saturated, information overflowing world: "*researchers and educators need to consider forms of inquiry and explanation that privilege modalities beyond written text*" (Bowen and Evans, 2015, p. 54). Recent studies by Boxenbaum et al. (2018) articulate the emergent contours of a *material and visual turn* in organisations. It can be argued that graphic and visual facilitation tap into the visual and material turn in organisations that *privilege modalities beyond written text* (cf. Chapter 2). When we look at the recent anthologies within the field, visual practice is described as "*a rich and diverse field, dramatically expanding*" (Agerbeck et al., 2016, p. 2). Blijsie, Hamons and Smith (2019, p. xiii) describe their book as "*a sizeable guidebook – a rich resource illustrating a rapidly expanding industry*". In the foreword of the same book, founder of graphic facilitation, David Sibbet, makes the

same argument that "*visual practice is a very big phenomenon*" (Sibbet, 2019, p. xviii). As readers, we are invited on a visual journey into an expanding field that also reflects the tendencies in society, with a large focus on visual culture (Mirzoeff, 2009).

Even though there is a tendency that contemporary organisations increasingly rely on material and visual tools, Boxenbaum et al. (2018) argue that "*our theories of organizations are ill equipped to capture the role that materiality and visuality play in the ways in which organizational actors engage with novel ideas and innovations*" (Boxenbaum et al., 2018, p. 598). From this perspective, my ambition is that the theoretical and empirical-based analysis of graphic and visual facilitation in this research project can contribute towards capturing some of the central aspects of what role graphic and visual facilitation play in organisations.

As mentioned in the introduction, this research project draws on van Vree's understanding of 'meeting' as the central focus when studying the dynamics of organisations (van Vree, 2011). Below, I will draw a connection between the practice of graphic and visual facilitation and a theoretical perspective on meeting culture in organisations.

Every scientific discipline relies on a range of different methodological approaches (Thorup, 2019). Since graphic and visual facilitation are just starting to become a scientific discipline, a backlist of methodological approaches are still to be built up in this field. From a theoretical perspective, I draw on inspiration from intellectual history to structure an approach on where to look when researching graphic facilitation as a 'field on the move'. As also mentioned in Chapter 2, I take a point of departure in a *historically inspired intellectual history* founded in the 1970s (Thorup, 2019, p. 82). From this position, the main purpose is to understand the cultural context of the formulation of ideas as well as the circulation of ideas (Thorup, 2019, p. 102). Thorup suggests different questions to ask when taking a historically inspired approach to text-reading of a social phenomenon such as: 1) What are the arguments of the text? 3) Which conventional ideas and arguments does the text refer to? 3) Which conventional ideas and arguments does it try to transgress?

I will try to draw connections between Sibbet's first book published in the 'Visual facilitation series' – *Visual Meetings* (2010) – and the historical and cultural context of 'meetings'. Likewise, I will draw on other practice-based handbooks within the field. The purpose is to reflect theoretically on which conventional ideas and arguments the texts refer to and which conventional ideas and arguments they try to transgress (Thorup, 2019).

Wilbert van Vree's research revolves around the historical development of meeting culture (van Vree, 1999; 2002; 2011). Van Vree presents the following definition of meetings in a specialized modern sense of: "*gathering together in order to talk and come to decisions about the common future*" (van Vree, 2011, p. 242). Van Vree (2011) argues that today's work in organisations typically revolves around meetings, because a lot of job functions are dominated by discussing, deliberating, negotiating and deciding in groups. Furthermore, when we are not participating in meetings, we are preparing for meetings or processing the results of them. Thus, he argues that "*Having to meet has become the fate of civilized people*" (van Vree, 2011, p. 250). Even though meetings have become 'the fate of civilized people', Van Vree poses a paradox: The higher an individual is in the hierarchy of an organisation, the greater the number of meetings. And if you are good at 'performing' meetings, you have a greater chance of promotion and rising within the hierarchy. On the other hand, for many employees meetings have *"become a grind and are often associated with boredom and dullness*" (van Vree, 2011, p. 254).

He further elaborates that despite the potential they offer for rising through the ranks, professionals for the most part usually disregard meetings.

When I turn to the literature within the field of graphic and visual facilitation, the same kind of characterization of traditional meetings is made. For example, Sibbet taps into the narrative about people's dislike of meetings, stating that: "*for many people meetings are a necessary pain, and often have a deserved bad reputation*" (Sibbet, 2010, p. xii). Likewise, Agerbeck emphasises that "*meetings are derided as timewasters as the ephemeral nature of conversation is lost in memory*" (Agerbeck, 2016, p. 7). Sibbet advocates that running effective meetings with extraordinary results can be done through the use of visuals. He further describes how a *visual revolution* is now taking place in business. Thus, he argues for the connection between the request of graphic facilitation and productivity in companies: "*the acceleration of interest in visual meeting is the rising need and in many cases demands for more interesting and productive meetings*" (Sibbet, 2010, p. xv). Furthermore, Ohmann and Kirkegaard (2021) commence their book on graphic facilitation with a narrative about a typical meeting where the dialogue between the participants goes in circles until someone 'grasps a marker' and starts to visually facilitate the meeting. From an intellectual historical perspective (Thorup, 2019), it can be argued that visual facilitators' arguments for using graphic facilitation try to transgress the conventional ideas about meetings. Thus, they propose a meeting format that tries to transgress the conventional meeting practice that professionals associate with boredom and dullness, according to van Vree (2011). It can be argued that the authors' argumentation for using graphic and visual facilitation to convey new meanings of meeting culture (Thorup, 2019) can be related to the overall material and visual turn in organisations, as articulated by Boxenbaum et al. (2018).

In his research on meeting culture, van Vree (2011) argues that throughout history "*the meetingization of society"* is a central aspect of civilizing processes, and has had a significant influence on how we arrange meetings today, where nuances in meeting formats have increased. Van Vree (2011) elaborates that during the most recent phase of social development, the challenge of ambitious people is to regulate the necessary meetings not so much by the nature of rigid rules and stately customs, but more in relation to conscious considerations of *efficiency, effectiveness* and *pleasure* (van Vree, p. 241). If we look at the arguments for using graphic and visual facilitation, words such as efficiency and effectiveness are commonly used (e.g. Sibbet, 2010; Agerbeck, 2012; Qvist-Sørensen and Baastrup, 2019). These aspects are also further investigated in Paper 3. Likewise, encouraging personal engagement (Blijsie, Hamons and Smith, 2019) and playful approaches (see further elaboration in Paper 2) are purposes addressed in relation to the visual methods, which could be associated with the word 'pleasure'.

From a historical perspective, van Vree describes how in agrarian cultures agreements and decisions made at meetings were frequently undocumented, but orally endorsed by sworn oaths, meals and prayers (van Vree, 2011). During the period of industrialization, different meeting practices developed such as the use of agendas, the selection of a chairman, the use of opening and closing rituals of meetings, etc. Van Vree emphasises that meeting culture in general has developed from very formal and restrictive formats to more polite, civilized, peaceful, differentiated, balanced and informal formats (van Vree, 2002). In today's meetings there is also more of a focus on the material documentation of meetings (van Vree, 2011), which encompasses the multimodal practices of organisations (Boxenbaum et al., 2018). It can be argued that the combination of verbal and visual language in graphic and visual facilitation (e.g. Nielsen et al., 2016) offers suggestions for how to

incorporate multimodal and informal practices in meetings. As outlined in Paper 2, it can be argued that the growing interest of employees in participating in basic courses on graphic and visual facilitation captures this tendency of acquiring competencies within these new forms of meeting practices. Thus, I take a point of departure in investigating these basic courses on graphic and visual facilitation, to gain insights into the new suggestions for multimodal and informal practices in meetings.

Based on van Vree's (2011) research on meeting cultures in organisations, he also draws a connection to the educational field: "*Learning how to participate in meetings has become an important part of the rearing and education of the young. Anyone who wants to participate in society with some degree of success needs to know and be able to apply elementary meeting rules, and to have mastered the type of language spoken in meetings*" (p.252). When I look at higher education and especially at universities with a Problem-Based Learning profile, the very foundation is group work organised in different kind of meeting formats between students and between students and teachers (Aalborg University, 2022). Thus, the ability to participate in meetings are an essential competence both in their academic years and afterwards as employees in companies. Newmann (2005) emphasises that *facilitation skills* are an important part of the professional repertoire for the students to develop in relation to problem-based learning (Newmann, 2005, p.16). Thus, I will argue that insights on the application of graphic and visual facilitation in organisational contexts have relevance for the designing of teaching in higher education, where students acquire skills in facilitating and participating in meetings.

4.2. Elaboration of the higher education context

In this section, I present the higher education context of the design experiments. Afterwards, I theoretically reflect on the tendencies within higher education, especially focusing on the humanities. The aim is to show how this research project taps into current discourses in the higher education context.

Empirical foundation in the higher educational context

As part of exploring the last part of the research question: *how can graphic and visual facilitation support design exploration in higher education*?, I conducted different design experiments in higher education (Cobb et al., 2003). In this section, I will describe the empirical foundation of design experiments occurring in this dissertations' research process. Every design experiment is targeted courses in higher education with an aim to support students' design exploration of a particular subject. Thus, the students are prompted to adopt a pragmatic inquiry approach to their design processes, e.g. a Design-Based Research approach (i.a. the twofold function of DBR). How graphic and visual facilitation was applied in each design experiment varies depending on the student groups. For example, the design experiment with NoVA art students had more focus on scaffolding learning spaces for students to use their familiar visual skills when exploring game design (see Paper 4), while design experiments targeting students within the humanities – with less familiarity with the use of visual methods in academia – were introduced to graphic facilitation and sketching through workshops (see further description, Paper 5 and Paper 6).

I have especially focused on describing the primary contexts where design experiments were explored. Furthermore, all design experiments are listed chronologically in Figure 19. As mentioned in the

introduction, my teaching experiments started in 2015, in the course Communication Design: Experiences, Time, and Space (10 ECTS). Thus, prior experimentations laid a foundation for the more systematic exploration during the research project. Description of the student groups from the primary contexts is briefly presented below and elaborated in Papers 4, 5 and 6.

Design experiments with students from primary contexts:

- **Master's students studying for a Nordic master's degree in Visual and Art Education (NoVA) (see further description in Paper 4):** NoVA is a two-year master programme, which educates students in contemporary art and visual culture to achieve an understanding of Nordic practices and traditions in art education and visual communication. The aim is to provide students with relevant competencies and didactical interaction skills to work in cross-cultural and international educational environments. Three Nordic universities provide teaching including Aalto University in Helsinki, Konstfack University in Stockholm, and Aalborg University in Copenhagen. The specific context of the design experiment was an eight-week online course, where students were encouraged to take the role as game designers, creating 'games for change' that could spur dialogues around issues normally taken for granted. NoVA students typically have a background in art, design and communication before they join the master programme. Thus, many of the students are familiar with visualisations as part of their work practices; however, the students are in general unfamiliar with theoretical and methodological frameworks for games.
- **Master's students studying IT, Learning and Organisational Change (ILOO) (see further description in Paper 5):** The two-year ILOO master's programme addresses research, development and the implementation of digital learning designs in a range of organisational and educational settings. Thus, it can be digital learning designs targeting the contexts of e.g. e-learning, flipped classrooms, video conferencing and so forth. ILOO master's students typically have a bachelor degree in pedagogy, teaching or computer science. Thus, they are skilled within those areas, but are not specifically trained in using drawing in an academic context. Based on a previous study (Buhl, 2018), two drawing workshops where included in a redesign of the course in 2019. The specific context of the design experiment was an eight-week course 'IT and Learning Design', in which groups of master's students were tasked to develop a digital learning design based on cases provided by external stakeholders. Thus, the students were tasked to take the role of learning designers developing digital learning designs targeting different collaborative learning environments. The course was held cross-campus, where a document camera was used to project drawing exercises to a wide-screen across the two locations.
- **Students studying for a Bachelor of Communication and Digital Media (see further description in Paper 6):** The context of the study was an 10 ECTS credit course titled 'Communication Design: Experiences, Time, and Space' held in 2019. The course was part of the three-year bachelor's programme in Communication and Digital Media within Humanities at Aalborg University, Denmark. Thus, the students were not especially trained in using visual ethnography, visual facilitation, sketching and animation-based sketching methods as academic tools prior to this course. The combination of different visual methods, where introduced to students at three workshops during the course. The students' challenge was to contribute to the international art center, Copenhagen Contemporary (CC), and help the museum achieve the goal of making their exhibition, 'Heirloom' by Larissa Sansour based on her Palestinian upbringing, more accessible to visitors. Thus, the students were encouraged to

take the role of communication designers when working on the challenge proposed by the external stakeholder. Based on previous iteration, the design experiments focusing on analysing redesigns such as the supplement of animation-based sketching, use of mobile design walls, and teacher's use of document camera introducing drawing exercises. Furthermore, the students' use of visual material during their final examination was a research focus in the study.

Design experiments with students from secondary contexts:

- Master of Arts in Learning and Innovative Change (LFP)
- Master's students studying Design for Play (and Design for People, Design for Planet)
- Master's students: MIL and MDO

Contexts of the design experiments in the PhD project:

Education level	Course	Place	Intervention	Learning goals	Itera-tions	Data collection
Students studying a Nordic master's degree in Visual and Art Education (NoVA) **Paper 4**	Online course: Games for change (5 ECTS)	Nordic collaboration between Aalborg University, Copenhagen, Aalto University, Helsinki, and Konstfack University, Stockholm	Scaffolding students' use of visual facilitation, e.g. visualisations and video production, teacher produced videos (Online teaching)	Students' development of game design	**2018** (based on course held in 2016)	**2018:** Teaching observation, students' videos of play sessions and visual productions, students' reflection Papers, written and oral evaluations (15 students)
Students studying a Bachelor in Communication and Digital Media (KOM) **Paper 5**	Communication Design: Experiences, Time, and Space (10 ECTS)	Aalborg University, Copenhagen	Workshops in graphic facilitation /sketching /stop motion videos	Students' development of communicatio n design	2018 **2019** 2020 2021	Teaching observation **2019:** Observation of students' final group examination, students' visual productions (6 groups, 30 students)
Master's students studying IT, Learning and Organisational Change (ILOO) **Paper 6**	IT and Learning Design (10 ECTS)	Aalborg University, Copenhagen / Aalborg	Workshops in graphic facilitation /sketching (Video conferencing)	Students' development of digital learning designs	**2019** (based on course held in 2018) 2020	Teaching observation. **2019:** Students' visual productions, post-course group (9 groups, 27 students)

Master's students studying Learning and Innovative Change (LFP)	Learning Portfolio and Professional Development Dialogue in Theory and Practice (10 ECTS)	Aalborg University, Copenhagen	Workshops in graphic facilitation /sketching	Students' development of learning portfolio and empirical methods	2018 2019	Teaching observation
Master's students studying Design for Play (Design for People, Design for Planet)	1) Value of Play 2) Deep Research (10 ECTS)	Design School Kolding	Workshop in graphic facilitation and visual methods for fieldwork	Students' development of visual research design for their projects	**2018** 2019	Teaching observation, Students' visual productions. **2018:** Students' reflection videos about the use of graphic facilitation (15 students)
Master's students studying IT and Learning (MIL)	Design and use of video activities for learning and collaboration processes (5 ECTS)	Aalborg University, Copenhagen	Workshops in graphic facilitation /sketching Teacher produced videos (Hybrid teaching)	Students' exploration and development of video activities	2020	Teaching observation, Students' written and audio-visual reflections on LMS, written post-course interviews with students (20 students)
Master's students studying data-driven organisational development (MDO)	Data sprint: Analysis of data in organisations and surroundings (10 ECTS)	Aalborg University, Copenhagen	Workshops in graphic facilitation /sketching Teacher produced videos (Video conferencing)	Students' development of visual data protocol	2020	Teaching observation

Figure 19: Overview of the contexts of the different design experiments

Figure 19 shows the different contexts in higher education in which design experiments were explored during the research project. The years in the column 'iterations' indicate the number of iterations in one context. If more iterations in one contexts, the year **emphasized** in column 'empirical data'**,** is where a more specific data collection took place. In each intervention, I explored *drawing as a means of developing educational design*. This approach is elaborated in section 5.2. The data collection for each design experiment varied depending on what was contextually possible and the character of the experiment. For example, some design experiments included re-testing of workshop formats with minor adjustments while others were more explorative, testing specific redesigns. The course 'Communication Design: Experiences, Time, and Space' (10 ECTS) is the course, where I made most iterations and redesigns of workshops (Paper 6). Thus, examples of minor adjustments from these iterations, will also be presented in section 5.2.

Interventions redesigned in collaboration with colleagues

As my colleagues from Research Lab: IT and Learning Design are also educational researchers, I have published about the abovementioned design experiments with together with them (e.g. Hautopp and Ejsing-Duun, 2020 (Paper 4)); Hautopp and Buhl, 2021 (Paper 5)); Ørngreen, Henningsen and Hautopp, 2021). Furthermore, I have participated in teaching and data collection of design experiments (Ejsing-Duun and Skovbjerg, 2019) and collaboratively redesigned courses building on previous studies (Buhl, 2018; Ørngreen, Henningsen and Hautopp, 2021). Likewise, previous collaborations with colleagues at Aalborg University and at NoVA master education led to invitations to research visits at both Design School Kolding and Konstfack University, Stockholm. Thus, I consider my research on graphic and visual facilitation highly dependent on my collaborations with colleagues and their expertise, which led to discussions of how graphic facilitation and visual methods can be framed and explored in different contexts in higher education.

In addition to my collaborative partners and co-authors of the papers, I will clarify three other collaborations, which especially affected the ideation and development of the design experiments.

Design experiment at Design School Kolding

Together with Professor Helle Marie Skovbjerg, I conducted two iterations of a design experiment at a Research course at the Design School, Kolding in 2018 and 2019. The first year, the design experiment was targeted master's students from the master's programme 'Design for Play', where students work cross-disciplinary with designing meaningful play experiences for people of all ages. In the design experiment, we wanted to challenge the students to use drawing as a part of their context investigation, when doing fieldwork and investigating target groups for their play designs. The students had prior experiences in producing drawings and other materials, when developing and communicating their design ideas, but they were not familiar with the use of visual tools as part of conducting their fieldwork. In second iteration in 2019, we redesigned the course to fit into curriculum for all three masters' programmes at the Design School including 'Design for People' and 'Design for Planet'. The design experiments provided rich insights into play theory and the use of drawing as an ethnographic method, which have been inspirational for further iterations together with students from humanities. Likewise, the research stay at Design School Kolding provided insight into the practices at a design education.

Video sketching framework

Together with three colleagues from Research Lab; IT and Learning Design Lab, I developed a video sketching framework (see Figure 20) (Ørngreen, Henningsen, Gundersen and Hautopp, 2017). Video sketching draws on various investigative sketching approaches to support inquiry into problem setting, solving and dialogue (Goldschmidt, 2003; Schön, 1992; Olofsson and Sjölen, 2007). In a video sketching session, participants uses rapid iterative sketching processes including pen, paper and other artefacts to materialise their ideas. The sketches are recorded, which means the video itself constitutes a form of temporal sketch – a video sketch. The video sketch is revisited, re-recorded and potentially rethought. Participants scaffold their reflective practices by shifting between modes inspired by the four different design genres: investigative, explorative, explanatory and persuasive (Olofsson and Sjölén, 2007). In a video sketching session, the different approaches aid the externalization of ideas, dialogue with peers and interaction with the material, which can lead the participants to new insights.

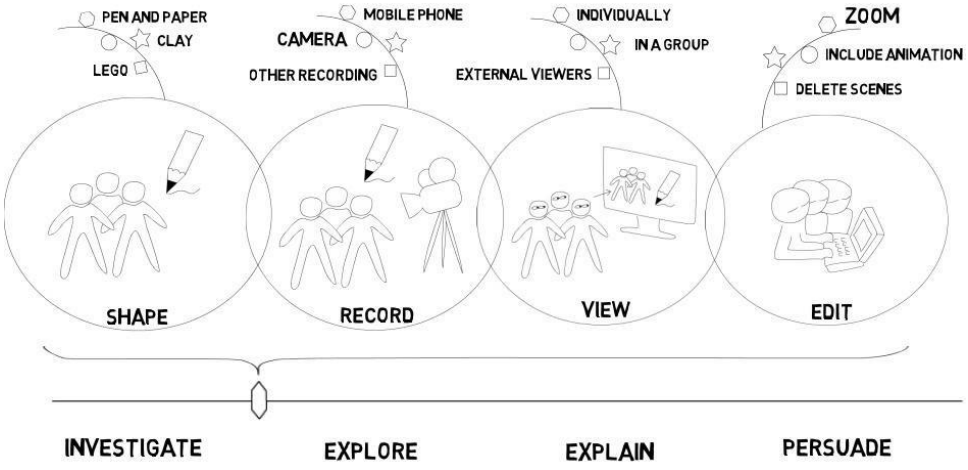


Figure 20: Video sketching framework, figure 1, Ørngreen et al., 2017, p. 423

The collaboration around the framework led to further investigation of the use of audio-creative methods in a hybrid format, including introductions to video sketching and graphic facilitation (Ørngreen, Henningsen and Hautopp, 2021). In Figure 19 this design experiment is listed in the context of master's students from IT and Learning (MIL). Inspiration from this collaboration has also been included in the design experiments of this research project, where visual facilitation were combined with video production to expand the time frame of students' design ideas (Papers 4 and 6).

Animation-based sketching

Inspired by animation-based sketching (Vistisen, 2016) and a workshop held together with Peter Vistisen in Research Lab: IT and Learning Design in 2017 (Vistisen and Hautopp, 2017), I have explored connections between graphic and visual facilitation and animation-based sketching. Based on the results from our workshop, the context of bachelor students from 'Communication and Digital Media' within Humanities' was emphasised as a context where animation-based sketching could be further explored (Vistisen and Hautopp, 2017, p. 10). Thus, in 2019, I redesigned the design experiment regarding this course with the aim of exploring the combination of graphic and visual facilitation and animation-based sketching, especially focusing on investigating the potential of the students using the sketch as a: "*piece of visual communication which encourages the designer, and other stakeholders, to comment, critique and propose interpretations that were not consciously integrated in the sketch by the designer*" (Vistisen, 2016, pp. 111-112). Results of this design experiment is elaborated in Paper 6. The collaboration with Vistisen also led to the organisation of a "Workshop with graphic facilitators – exploration and development of analogue and digital possibilities within graphic facilitation practices" (2018). As mentioned, insights from this workshop was included in Chapter 2.

Theoretical reflections on the higher educational context

In this section, I will elaborate on the higher educational contexts and the discourses from this field, to which the research project aims to contribute.

In each of the design experiments presented in Papers 4, 5 and 6, the students were encouraged to take the role of designers. As previous argued, here the students' facilitation of PBL group meetings (Newmann, 2005) were essential as part of their design exploration. For example, in paper 4, the

different student activities within problem-based learning are outlined and connected to the roles of the students as designers taken a pragmatic approach to game design. Likewise, teaching that encourage students to develop 'criticality', meaning emotional, intellectual, and practical independence, is emphasised (Savin-Baden, 2003). When we positioned students as designers of learning, communication and games using various multimodal materials to create designs targeting different groups of people, we also encouraged their critical inquiry. Here I draw inspiration from previous mentioned sources (Brown, 1993; Savin-Baden, 2003) stating that self-directed inquiry processes can support critical thinking. To discuss these skills in relation to the context of higher education, I will describe tendencies in higher education with a special focus on *Humanities* which – as argued in the introduction – are the main higher educational context of the research project.

The Humanities are known for its study of human experience where focus on subjectivity, imagination, commitment, and a concern for justice is valued (Cross et. al., 2006). When placing this research project in humanities, I will especially draw attention to two researchers who have debated the role of humanities in society, namely Matha C. Nussbaum in her book *Not for profit – why democracy needs humanities* (2016) and Hartmut Rosa in his book *Resonance* (2019). Nussbaum (2016) argues that our very fundament of global citizenship rest on the humanities and arts. She argues that humanities and arts provide skills that are essential to keep democracy healthy, especially critical thinking and imagination. Furthermore, she argues that a trained imagination lay the foundation for innovative solution on the complex problems, which the world is facing today. In Paper 6, findings show how the students through their design exploration, managed to imagine the perspectives from both the artist and visitors as well as providing critical stands towards the globally positon of power, reflected in a new visualization of the "World Map" (see further analysis in Paper 6, p. 6918).

As mentioned in section 1.1. *Connecting academic disciplines in higher education*, Cross et al. (2006) argues for design to be a third basic culture of the education of everyone, as the same way that the authors' claim that science and humanities are. On contrary, Nussbaum argues that humanities needs to be a part of everyone's education, also at university level, where she resists the conditions, where students actively have to choose "*humanities subject as their **only** field, closing off opportunities elsewhere*" (Nussbaum, 2016, p. xix). It can be argued, that Nussbaum questioning the claim proposed by Cross et. al.; that humanities is a part of everyone's education (at least when we talk about university level). In their book**,** *Designerly ways of knowing,* Cross et al., 2006 discuss, whether it would be better to regard the third basic culture as *technology* rather than design. They further elaborate their considerations: "(…) *design is, after all, the culture of the technologist – of the designer, doer and maker. Technology involves a synthesis of knowledge and skills from both the sciences and the humanities, in the pursuit of practical tasks; it is not simply 'applied science', but 'the application of scientific and other organised knowledge to practical tasks'…*" (Cross, et al., 2006, p. 2). As mentioned in the introduction, I have from elementary school been educated to think cross-disciplinary, and this way of seeing technology as a 'synthesis between the science and the humanities' which have 'the designerly application of knowledge to practical skills', resonates with my understanding of cross-disciplinary approaches to knowledge production. From a Deweyan perspective, other researchers argue, that *technology* is a broad classification of the means and artefacts employed in inquiry including both theories and tools (Hansen and Dalsgaard, 2012). From these perspectives, I would emphasise that the student groups from humanities, that I have worked with in this research project: *Bachelor in Communication and Digital Media* and *Master's students studying IT, Learning and Organisational Change* are educational programmes, that encourage this cross-disciplinary inquiry

focus on both humanities and technology/design, which Nussbaum (2016) request at the university level.

Researchers within higher education, Helen Pokorny and Digby Warren, edited the book *Enhancing Teaching Practice in Higher Education* (2021) addressing current possibilities and challenges in higher education. The authors argue for higher education teaching as transformational practices and as holistic processes of creating the conditions in which each student can thrive (Pokorny and Warren, 2021, p. 5). The second edition of the book provides e.g. a new Chapter on "Holistic and creative pedagogies" (Warren and Payton, 2021), from which I will draw some main points and discuss these in relation to the current research project. The decision about adding the new chapter, indicates that holistic and creative approaches are gaining ground in higher education. As outlined in Paper 6, I will argue that the use of visual methods in higher education can encourage creative approaches among students when going into design exploration. Researchers within higher education argue that representation of knowledge in different modalities, e.g. drawing, animation and videos, forces learners into new ways of thinking, seeing and communicating (Sinfield, Burns, and Abegglen, 2019), which this research project aims to explore. Even though there is a tendencies towards incorporating holistic and creative processes in higher education, there are also challenges in relation to assessment of visual approaches as part of curricular (Warren and Payton, 2021), while students nor teachers have a tradition on how to measure these approaches in higher education. The challenges of assessing designerly and creative processes in higher education is further addressed and analysed in Paper 6.

The challenge of measuring creative and holistic approaches in higher education, may also rely on the fact that these ways of working might not be easy to measure with the standardised measurement tools, we have in higher education. Without starting a thorough discussion on examination practices in education, I will emphasise another researcher who as Nussbaum (2016, p.95) points to a central human condition, that we cannot relate to the complex world around us by factual knowledge and logic alone. Sociologist, Hartmut Rosa (2019), describes our Modern society as focusing on continuous optimisation, where permanent acceleration and growth characterise the goals of institutions and organisations. Rosa further argues that this constantly chasing of improvement requires people to be driven by the emotional energy of fear, because the systems encourage us to run faster, to growth and to accelerate. This condition can make people feel alienated from the world. As an opposite to this focus of optimisation, Rosa argues that people are seeking for *resonance*. He elaborates that resonance is a kind of relationship to the world, formed through affect and emotion, intrinsic interest and perceived self-efficacy: "*in which subject and world are mutually affected and transformed*" (Rosa, 2019, p.174). Moreover, Rosa (2019) emphasises, that "*resonance is not an emotional state, but a mode of relation*" (p.168) and resonance should not be confused with the concept of echoing, because "*an echo lacks its own voice*" (p.167).

Rosa argues that nature, art, and religion are constitutive resonant spaces for modern society (Rosa, 2019, p. 173). When I draw on previous mentioned sources, it can be argued that the act of drawing can slow the pace down (Frank and Madsen, 2020) and encourage us to be present and use all our senses (Causey, 2017). Thus, I will argue that the use of graphic and visual facilitation combined with other methods, can be a way to foster creative and holistic approaches (Pokorny and Warren, 2021) which do not rely on factual knowledge and logic alone (Nussbaum, 2016).

At a recent youth conference in Copenhagen, Hartmut Rosa, emphasised that we cannot guarantee the results of resonance, only that: "*new ideas, the new solutions, the new features are born in the*

moments of resonance" (Rosa, 2021: 33:45). At the same time, he exemplifies that those moments of resonance do not necessarily derive from a feeling of harmony. He further argues that resonance and alienation do not represent a simple dichotomy, but in fact are complexly interrelated (Rosa, p.170). Felski (2020) have specifically discussed Rosa's theory of resonance in relation to education, and she emphasises that resonance: "*is not identical to pleasure or positive affect; things that we find stimulating and fulfilling can be a source of stress or ambivalence. It is not simply opposed to alienation, but also interrelated with it*" (Felski, 2020, p.2). In relation to participants and students' first encounter with graphic and visual facilitation, where they both feel an excitement, but are also questioning their own drawing abilities, feeling reluctant to draw in front of others (cf. section 1.4., Paper 2, and 5), may indicate a resonant relationship between them and the materials/drawing activities, encompasses both fear and joy.

Rosa addresses that we cannot predict whether or how moments of resonance will occur, but we can try to make space that allow resonant relationship to occur (Rosa, 2019, p.173). Felski further argues, that education is not about creating spaces of harmonies, but also about things matters: "*Resonance is neutral with respect to emotional content – it is about mattering rather than making happy, not just a question of pleasure, but about how things come to concern or affect us*" (Felski, 2020, p.2). Throughout the design experiments, I had especially focus on investigating the participants' experiences with the use of the visual methods as part of their design exploration in higher education. In chapter 9, I will discuss a meta-perspective of resonance in relation to the research results.

In this section, I have introduced and discussed tendencies in higher education with a specific focus on humanities. Likewise, I have shown how this research project taps into the discussions in the field. In next section, I will argue for the choice of empirical foundation, before the presentation of papers in Chapter 7.

4.3. Selection of primary empirical foundation

In this section, I will briefly argue, how I have selected the empirical foundation for this research project. As presented in both the organisational and higher educational context description, I have conducted various empirical data during the four-year period of the research project. Brinkmann (2012) points to a risk, that qualitative researchers can end up 'drowning in data' during large-scale research project (p.1). Thus, it become relevant to single-out which empirical data to focus on, when going into more thorough analysis. As Cobb et. al. (2003) emphasises, it is essential to decide what is the target of investigation and what is the background conditions in design experiments. I consider these decisions of relevant both in each specific experiment and across experiments, and I will elaborate on my definitions of primary and secondary contexts below.

This research project aims to draw lines from the organisational context to a higher educational context, where the focus is learning processes and teaching processes from both teachers' and learners' perspectives. Therefore, I have chosen to focus the empirical data from the organisational context to concern teaching situations at basic graphic facilitation courses and following the participants implementing the visual methods in their daily work life afterwards. Combining the observation of teaching with interviews (Paper 2), led me to investigate the teachers' didactical consideration more in detail that solely interviews allowed. However, the interviews and workshop

with graphic and visual facilitators from the secondary context functioned as background information to supplement and nuance perspectives of the results of the primary investigation. Likewise, the same goes with my participation at the EuViz Conference 2018, network meetings and drawing courses. At the EuViz Conference, I was honoured to experience a high degree of interest in my research project and many international facilitators volunteered to be a part of the research, e.g. through interviews, visit at companies, etc. In 2018, I was at the beginning of my research process and I was seeking opportunities, still figuring out how to identify the specific scope of my PhD project. When I have chosen not to involve the international facilitators further, it is based on the assumption that it would be an extensive work to investigate the specific organisational and educational systems in their countries in order to situate and analyse the visual practice in relation to their local contexts. Thus, I have chosen to focus on a local context in Denmark, which I am more familiar with, but with the aim of demonstrating the value in both local context and the potentials in other local contexts (Barab and Squire, 2004). Thus, I also draw on international research, handbooks and practices as described in Paper 1 and Chapter 2.

Even though, I have conducted different empirical data at the Design School Kolding, I have chosen to focus the thorough analysis and theoretical reflections of the design experiments targeted humanities students, as these are the primary target group of the research in higher education. Likewise, I have chosen to focus on design experiments (Paper 5 and 6), that provided a possibility to conduct continuous and iterative refinements over a longer period, which is requested when doing DBR (Anderson and Shattuck, 2012). However, the design experiments and teaching experiences from the secondary higher educational contexts have also inspired and nuanced my exploration of the design experiments in the primary contexts. Thus, the secondary contexts have functioned as a background (Cobb et al., 2003) for the primary contexts. Likewise, in each design experiment different target of investigation is highlighted and analysed, e.g. in Paper 6, where the use of animation-based sketching was a redesign and a specific target of investigation.

Chapter 5: Drawing as a research approach

In this section, I will describe and analyse how I have used drawings in different ways throughout the PhD project. Design Anthropologist Sarah Pink argues that there is no recipe when using visual methods as part of a research project as methods are developed and actualized *through* the process (Pink, 2007, p. 5). Likewise, Leavy expresses how arts-based researchers do not discover new research tools, they *carve* them (Leavy, 2020, p. 3). From a pragmatic perspective, I consider my use of visual methods throughout the PhD project as a dynamical exploration. As there is no recipe for visual methods, I took inspiration from different graphic facilitation practice books and courses as well as being inspired by research papers, other academic fields, PhD courses and conferences. I ideated and combined methods in collaboration with colleagues to explore how they would work in different contexts in higher education.

Below I will address three different ways of how I used drawings during the research project:

1. Exploration of drawings as a means of doing visual research
2. Exploration of drawings as a means of developing educational designs
3. Exploration of drawings as a means of presenting research

I will elaborate the background of each exploration tight tied to some concrete examples, while other examples are presented in the papers.

5.1 Exploration of drawings as a means of doing visual research

Due to the limitations sociologist Patricia Leavy has identified in traditional academic articles, she has turned to expressive art. The aim of her book *Method Meets Art* (2020) is to harness the power of arts in research endeavours. Leavy describes how we as researchers are often trained to hide our relationship to our work, which she describes as problematic for some and impossible for others. Leavy argues that arts-based research (ABR) practices allow researchers to share their relationship to their work with the audience who experience their work; in my PhD project, I use a combination of text and drawings produced as representational forms (Leavy, 2020, p. 4) of the research process. Leavy further explains how some researchers have come to ABR practices as a way of better addressing research questions while others quite "*explicitly long to merge their scholar-self with their artist-self*" (Leavy, 2020, p. 3). Although graphic facilitation is not framed as an artistic method, the very craft of drawing have similarities with the work of an artist's drawing work, but without a focus on aesthetic results (Valenza and Adkins, 2009). As graphic facilitator, Brandy Agerbeck, notes, we are often "*confusing an action anyone can partake in (drawing) with the narrowly defined role (artist)*" (Agerbeck, 2016, p.9). Thus, Agerbeck argues that we need to break with our own inner critic, telling us that 'we cannot draw' (see further discussion on this theme in Paper 2). I will argue that the act of drawing in higher education can be characterised as a way of merging scholarly and artistic methods in this field, especially focusing on the humanities. As described by Leavy, the longing to merge my scholar-self and artist-self started in my own initial encounter with graphic facilitation, which sparked the further exploration of this research project.

Artist-ethnographer Andrew Causey (2017) has combined his work as an anthropologist with his passion for drawing. Thus, based on Leavy (2020), it can be argued that Causey's work *Drawn to see* (2017) is an example of how he merged his scholar-self with his artist-self by using drawing as a central

part of doing ethnographic fieldwork. Causey does not intend to give a strict recipe for how to use drawing as an ethnographic research approach. Rather his advices are an attempt to invite researchers and students to use drawings as "*another set of options for collecting, recording and presenting ethnographic information"* (Causey, 2017, p. 3).

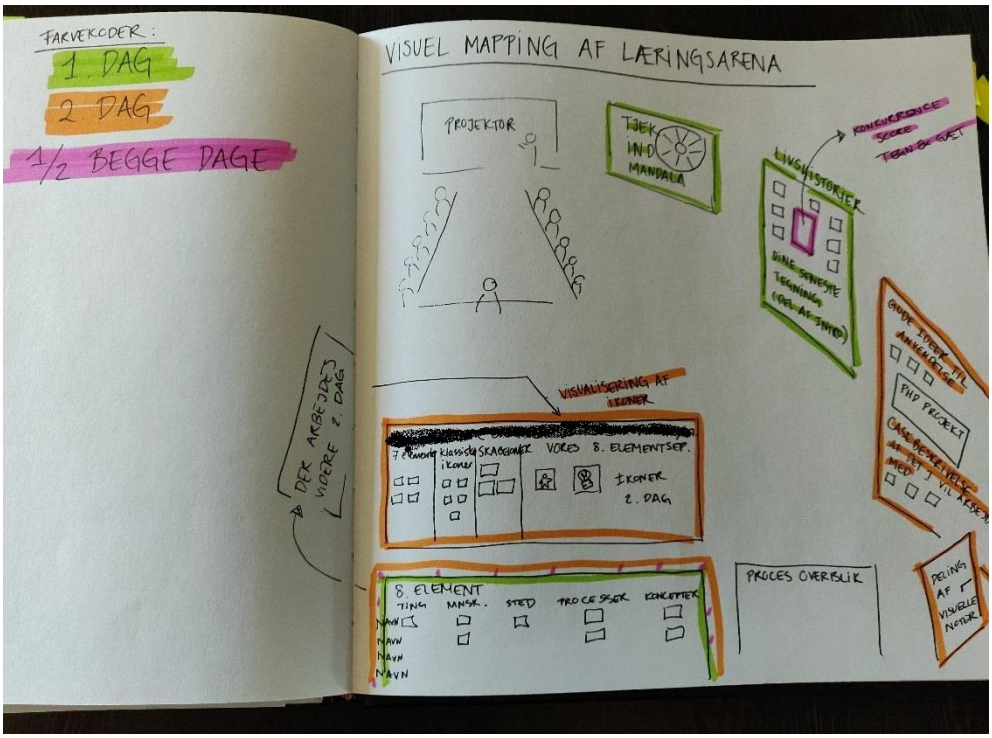


Figure 21: A visual note from my participatory observations at a basic graphic facilitation course

Figure 21 shows a visual field note made in relation to the ethnographic study of Paper 2. Here I did participatory observations on a basic graphic facilitation course and used drawings as a way to collect data (Causey, 2017). In the specific drawing, I mapped the course facilities and colour-coordinated the different teaching activities, where the teacher explicitly hung the participants' drawings on the walls of the room in what he termed 'creating a visual learning arena'. My drawing and colour mapping made me recall the different activities afterwards, which enabled me to discuss specific situations from the teaching with the teacher in the follow-up interview (see further analysis in Paper 2). As Causey writes: "*drawing the scene enlivened my ability to write about it*" (Causey, 2017, p. 7). This resonates with my way of working, where drawing supported my observations and analysis and thereby the knowledge production and academic writing.

In Paper 3, I further explored the use of 'drawings as a research approach'. To investigate the long-term perspectives of employees' use of graphic facilitation, I asked the employees to bring examples of concrete drawings used in their own work context.

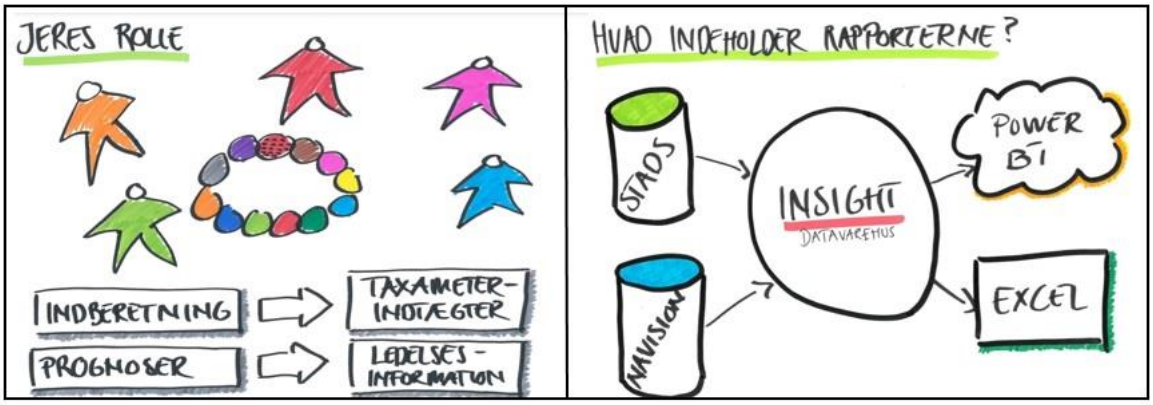


Figure 22: Two drawings shared by a participant in the interview on long-term perspectives

Figure 22 show an example of a drawing shared by an employee when we went into dialogue around how she perceived her use of graphic facilitation eight months after participating in a basic graphic facilitation course. The participant reflected upon how her preparation for the meeting was different when she was drawing the presentation compared to when she had used screen dumps of the programme that she was going to introduce to her colleagues. Based on the drawings, she reflected on her preparation (Schön, 1983) as follows: "*If I had just made a standard PowerPoint presentation, then there would have been much more text. And this way, it [graphic facilitation] is a good way for me to think about how much is necessary to represent the points*?". It can be argued that this reflection from the participant also mirrors a point within the field about drawing the essence when using visuals at meetings (Sibbet, 2010). Besides reflecting on her preparation phase, the participant also shared how she used colours to map different relations between her colleagues and new work tasks and how she developed the analogue material on a flip-over into scans for a PowerPoint presentation distributed within the organisations. Further analysis of the employees' use of graphic facilitation in their own work contexts is placed in Paper 3. From a methodological perspective, the drawings grounded the interview in the participants' experiences (Wang, 1999), which opened up for different angles discussed in the interview. In a future study, this approach could also be used with teachers, where they could bring visual examples from their own teaching, which they perceive as significant for their didactical considerations regarding preparation for teaching. In the next section, I will elaborate upon how I used drawings in my own preparation of teaching in relation to the different design experiments conducted in Papers 4, 5 and 6.

5.2 Exploration of drawings as a means of developing educational designs

As described in Papers 4, 5 and 6, I consider both students' roles and teachers' roles as designers, when conducting design experiments: "*As students were asked to adopt the role of game designers, we also consider our role as educators to be designers of teaching (Sørensen and Levinsen, 2018; Ejsing-Duun and Skovbjerg, 2018) when doing educational research"* (Hautopp and Ejsing-Duun, 2020, p. 375 – Paper 4). In line with the DBR approach, I will elaborate on the teacher's role as a designer based on the paper "Teaching as design" (2015) by higher educational researcher, Peter Goodyear. Goodyear advocates for teachers to perceive teaching in higher education as designing a learning environment for students to tackle complex and ill-defined problems. He argues for teaching as multidimensional and containing three different temporal dimensions:

- **Interactive forms of teaching** that involve real-time exposition and other kinds of instruction, as well as facilitation of students' learning activities
- **Pre-active forms of teaching:** planning, design, etc.
- **Post-active forms of teaching:** reflection, evaluation, assessment (Goodyear, 2015, p. 32)

As mentioned, the design-based research approach to design experiments requires a dynamical design and redesign of iterations (Barab and Squire, 2014; Anderson and Shattuck, 2012). Therefore, tests of, reflections on and adjustments of interventions are crucial for knowledge production. In the Papers on design experiments (Papers 4, 5 and 6), what Goodyear (2015) referred to as 'the interactive forms of teaching' are presented with less focus on the *pre-active forms* and more on the *post-active forms*, primarily the larger redesign of the design experiments. To provide further insights into the pre-active preparation and post-active reflection on minor adjustments in the educational design, I elaborate on the pre-active and post-active forms below. The greatest departure can be seen in the design experiment for Paper 6, as this is the experiment in which I made the most iterations and re-designs of all the studies conducted during the period from 2015 to 2021. I primarily use examples from the iterations in 2019 and 2020. Figure 35 shows an overview of the redesign of the design experiments.

Goodyear emphasises that planning and designing teaching are not the same thing. He argues that designing entails planning, but it also involves more than planning: "*it introduces some distinctive kinds of problems and ways of handling them*" (Goodyear, 2015, p. 34). Goodyear further emphasises that the teacher's framing of tasks is pivotal in influencing the students' response to these tasks. However, only teachers' written and spoken tasks are explicitly mentioned (p. 39). In this research project, I explore how graphic and visual facilitation can be introduced to students "as ways of handling distinctive kinds of problems" inspired by visual design approaches. Not just teacher's *writing* or *speaking* of the use of visual methods, but the teacher's framing of drawing exercises by *showing* and *reflecting* the drawing exercises theoretically and contextualized together with the students (see further argumentation in Papers 5 and 6).

Examples of pre-active forms of teaching

As mentioned, I started my exploration of graphic facilitation in the academic field back in 2015. In order to plan a workshop in graphic and visual facilitation for students, I gathered inspiration from different sources, including prior teaching experiences. As a graphic facilitator, you are encouraged to be inspired by other facilitators (Agerbeck, 2012). Some handbooks even suggest that you 'steal with pride' (Nielsen et al., 2016, p. 71) when a drawing catches your eye in your surroundings, in a symbol book or in a search on the internet, etc. Below I will elaborate on a couple of examples from my preparation for my first workshop held at the university. The purpose is to show the iterative development of teaching negotiated in relation to the consequences that I experienced in practice (Dewey, 2007). As mentioned in Paper 5, the drawing workshops were positioned in the *lab phase* of the DBR model, in which students explore design ideas and develop prototypes of their ideas to be tested in the intervention phase (Christensen et al., 2012).

As part of my preparation, I searched Google Images for inspiration on graphic facilitation and came across the following quote: "*From head to paper – no need for fancy art*" with an accompanying drawing similar to my redesign below:

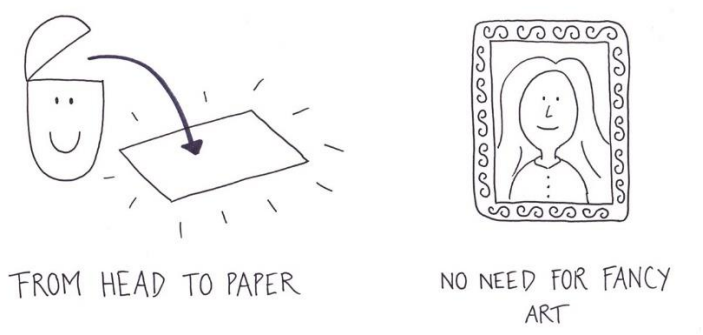


Figure 23: Introduction slide to most of my teaching in graphic facilitation

Throughout my teaching I have used the above drawing as a visual and written metaphor to underline a main point within graphic facilitation and sketching; that the drawings are not supposed to be either aesthetic or naturalistic reproductions of the world (e.g. Valenza and Adkins, 2009). Rather they are about externalizing ideas, and putting them up for discussion (e.g. Twersky and Suwa, 2009) in student groups. In a paper from 2017 "Sketching – from head to paper, no need for fancy art", I describe the connection between sketching and graphic facilitation combined with reflection on my teaching experiences within the field (Hautopp, 2017). I have conducted further exploration of the workshop format, which is described and discussed in Paper 5: "Section 2.1. Pedagogical intervention: Drawing workshop" (Hautopp and Buhl, 2021, pp. 323 - 325). An intervention format typically consists of two drawing workshops, where the first workshop focuses on initial *idea generation* (Schön, 1983; Goldschmidt, 2003; Tversky and Suwa, 2009), while the second workshop focuses more on the *presentation* of design ideas (Qvist-Sørensen and Baastrup, 2020). In this workshop format, I connect the perspectives from the design field and the graphic and visual facilitation field. Below I present a concrete example of how I connect drawing exercises with theoretical perspectives within design the design field (Goldschmidt, 2003).

Based on an exercise from my own experiences as a learner on a basic course in graphic facilitation held by Mie Nørgaard in 2015, I suggested that the students draw a handful of doodles with their eyes closed. Afterwards, the students were encouraged to develop their drawings into what sparked their minds. I relate this activity to architect and professor Gabriella Goldschmidt's notion of "The backtalk of self-generated sketches" (2003).

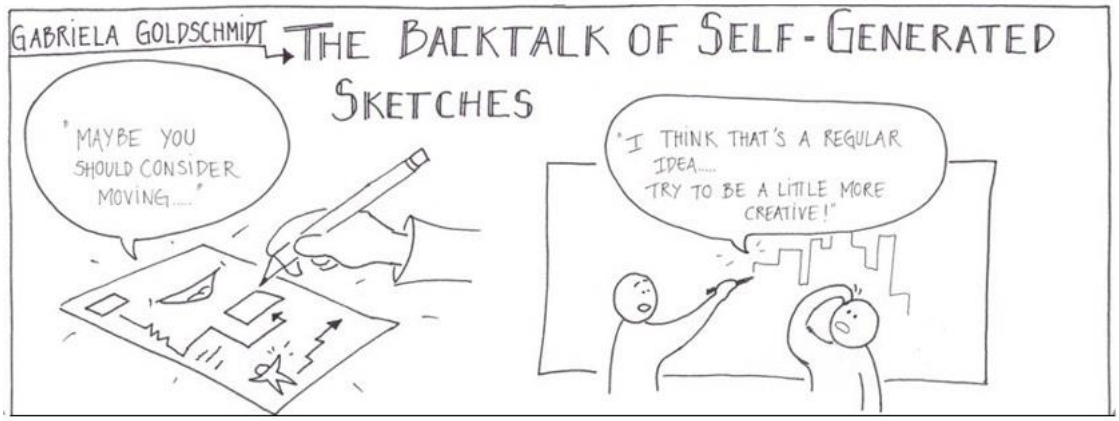


Figure 24: Presentation drawing from workshop in graphic facilitation – visualizing 'backtalk' inspired by Goldschmidt's article (2003)

Inspired by Schön (1983), Goldschmidt argues that architects enter into a conversation with materials *through* the sketching process. Goldschmidt describes how free hand sketching is rapid and direct and provides instant feedback. Thus, the sketcher is highly sensitive to clues which can trigger development in the drawing and design ideas. Goldschmidt describes how sketching serves as an extension of imagery; she refers to it as "interactive imagery" (Goldschmidt, 2003, p. 83). She further elaborates how interactive imagery implies a circular feedback loop between two kinds of pictorial representation: internal representation in imagery, and external representation on Paper or some other sketching surface. The purpose of the doodle exercise in the teaching session is to show in a simple way that the act of drawing does not need to be predefined. Quite the reverse, the drawing exercise can spur new design ideation in the student groups as: "*one reads off the sketch more information than was invested in its making"* (Goldschmidt, 2003, p. 78).

After creating eight doodles with our eyes closed, we entered into a backtalk with the drawings (Goldschmidt, 2003) where the students developed their doodles, often resulting in fantasy animals and laughter, when sharing the drawings with each other.

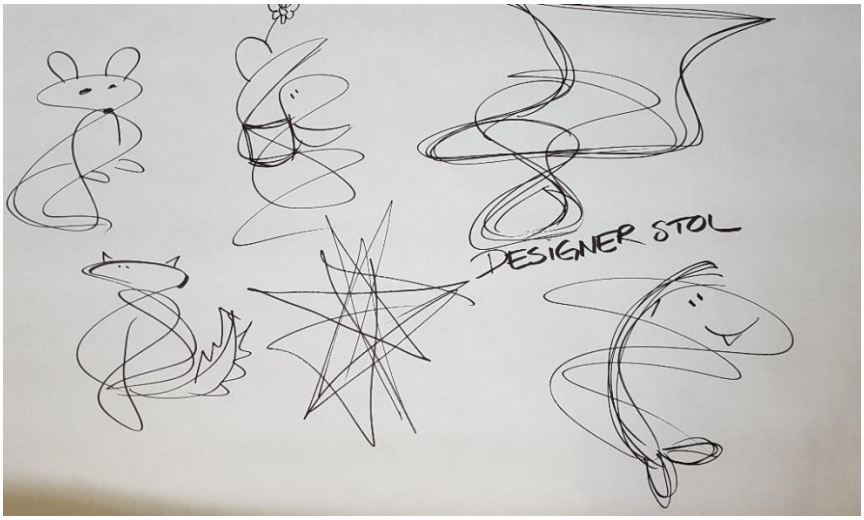


Figure 25: Examples of imaginative development of doodles

While participating in other graphic facilitation courses, e.g. held by Bigger Picture, I experienced the use of *Draw and Guess* games where participants competed in groups and became caught up in the game, forgetting to worry about their drawing skills. As one teacher explained about the *Draw and Guess* game: "*The participants just draw what they can. So the purpose is to show that they can already draw, they already had a figurative language that I did not have to teach them*". Inspiration from this drawing exercise, I further explored in higher education.

Examples of post-active forms of teaching – redesign of design experiments

In this section, I will describe post-active forms of teaching which led to reflection and evaluation (Goodyear, 2015) and adjustment of the design experiments. At the beginning of the design experiments (2018 and prior), I had an assumption that I should lecture on the theoretical background of graphic and visual facilitation and design sketching *before* I introduced students to concrete drawing exercises.

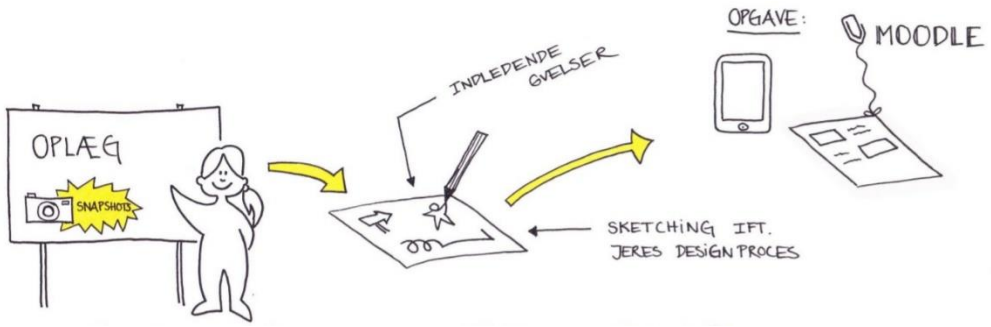


Figure 26: Example of presentation drawing of a teaching plan (2015)

Figure 26 shows a structure from the first workshop, beginning with a theoretical introduction followed by the practical exercises of drawing. As described in Section 1.4., some students felt outside their comfort zone and stated that they could not draw when they saw the paper and pens placed on the table at the beginning of the teaching session. However, my overall impression was that they came to appreciate the method once we got started. As I contextualised the theoretical background of graphic and visual facilitation in design sketching, I came to realise that it was more useful to start interventions with drawing exercises to ground the theoretical reflection in practice (Dewey, 2007; Brinkmann, 2012). This conflicted with my intention of creating a safe and playful environment (inspired by the results of the ethnographic study in organisations presented in Paper 2), so I included the drawing shown in Figure 27 in my PowerPoint slides.

Figure 27: An invitation for students to draw at the university

I then talked for 20–30 minutes about the theoretical background of drawing before we *actually* started drawing. In retrospect, I was probably influenced by traditional conventions of higher education teaching, in which students are treated as spectators in auditoriums listening to theoretical lectures performed by omniscient teachers (Brinkmann and Tanggaard, 2013). Even though I wanted to challenge this understanding of teaching, I was still influenced by prior understanding of teaching (see Ilyin, 2019). Of course, not all current teaching in higher educational contexts plays out this way, especially not at PBL universities, where facilitation of students' group processes is of the essence (Savin-Baden, 2003). When reflecting on my own teaching practice, I would argue that because I did not have much experience with teaching graphic and visual facilitation at the university, I was a bit nervous regarding how the students would respond to the pens and papers. Thus, I guarded the drawing activities with a theoretical introduction beforehand, *verbally explaining* the visual methods as a way to handle their design processes. As argued in the beginning of this section, I wanted to *show* ways to handle problems instead of just framing the task in a written and verbal format, as suggested by Goodyear (2015). Thus, from 2019 onwards, I would begin design experiments by incorporating drawing exercises together with the students *before* elaborating on the theoretical background. The purpose was for students to gain practical experience with drawing and then theoretically reflect on this experience afterwards.

Aside from the doodle exercise, I was also inspired by the draw and guess game discussed in the introduction of this section. I selected different words reflecting the challenge and context that students had been introduced to in the specific course, which ranged from simple (e.g., things and people) to more complex (e.g., processes and concepts) (Qvist-Sørensen and Baastrup, 2019). For example, in the design experiment in Paper 6, the students' challenge was to contribute to the international art centre, Copenhagen Contemporary (CC), and help the museum achieve the goal of making their exhibition ('Heirloom' by Larissa Sansour, which was based on her Palestinian upbringing) more accessible to visitors (see further description of the context in Paper 6). Thus, I chose the words *porcelain, painting, exhibition, conflict* and *science fiction* for the students to draw and guess in turns in groups. The words were all related to Sansour's exhibition, and with this little drawing competition between the groups, I also experienced what the previous teacher mentioned: that everyone forgot about their awareness of their own drawing style while engaging in the exercise.

As described in Papers 5 and 6, I then introduced drawing exercises involving the use of simple icons and elements to illustrate people, places and processes, using speech, text, colours and effects to highlight key words and elements (Qvist-Sørensen and Baastrup, 2019). For an overview of the introduction to the drawing exercises in 2019, see Appendix A. One example I wish to emphasise is the drawing of people, in which I would start by introducing the star person (see further description in Paper 1) and then encourage students to develop their own style in relation to their context, as suggested by Qvist-Sørensen and Baastrup (2019). This point is also significant because the student groups had to target their design exploration and concepts for different user groups.

Figure 28: Examples of variations of the star person

Figure 28 show my introduction to the element of people and variations of the star person, where e.g. the 'spiral' person is inspired by Ullersted's (2015) drawing style. Figure 29 shows an example of how a student group developed their own personal style when drawing a visitor to Sansour's exhibition.

Figure 29: Students' development of their own visual vocabulary and personal style of drawing

In their design, the student group wanted to address the theme of reflecting on one's roots, symbolised by the tree. The aim was to bridge connections between the visitors and the themes that they perceived in Sansour's exhibition. A more thorough analysis of the students' use of a combination of visual methods in their design processes can be found in Paper 6.

As mentioned in Paper 6, the research and teacher team also introduced the students to critical design (DiSalvo, 2009; Dunne and Raby, 2013) with a focus on not just solving design problems but also using design to foster questioning and dialogues about issues normally taken for granted, which is also a focus in Paper 4. To connect this design perspective to a more concrete visual approach, I introduced students to *extreme sketching* as suggested by Nørgaard (2012). In this approach, Nørgaard advocated for the use of *humour* or *reversed situations* to provoke and spark innovative thinking with her clients when discussing potentials and barriers of their business model (Nørgaard, 2012, p.7). In line with my research finding that the use of humour and visual metaphors is significant for graphic and visual facilitation practice (see Paper 2), I also included the paper by Nørgaard and examples of a drawing she made at the opening of the Visual Studies and Learning Design research centre at Aalborg University, Copenhagen, in 2016, where we had a stand introducing attendees to graphic and visual facilitation.

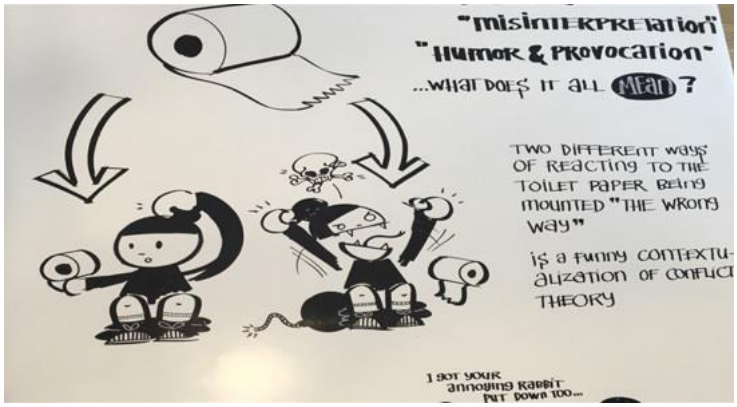


Figure 30: Drawing by Mie Nørgaard illustrating a conflict management situation (2016)

Figure 30 show an everyday life experience in which a person discovers that the toilet paper is placed the wrong way, making it difficult to turn the toilet roll. Nørgaard uses humour and expressive effects to illustrate two different ways of handling a conflict. In the teaching lesson, a student group was inspired by Nørgaard's drawing and used a similar style actualised in relation to their context (see Figure 31).

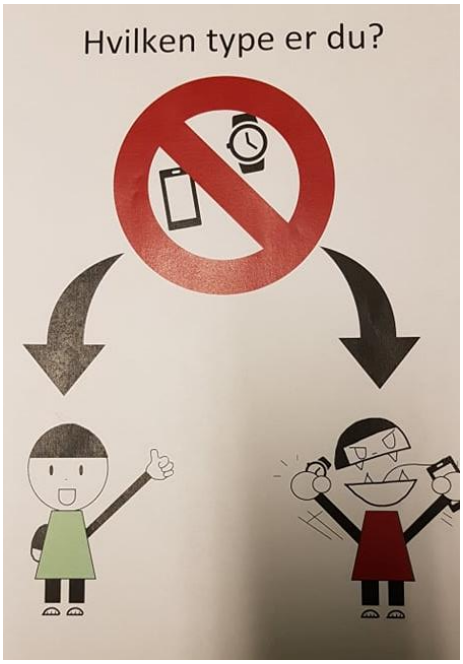
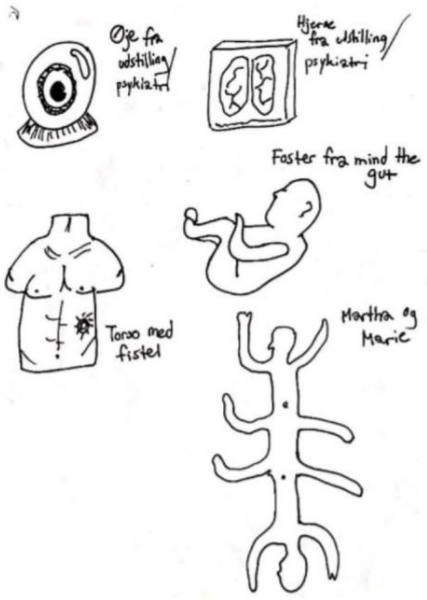


Figure 31: A student group's drawing of a conflict situation inspired by Nørgaard's drawing

In their design idea, the student group wanted to prompt visitors to reflect on their use of time, as they extracted time as a theme in Sansour's exhibition. Thus, they wanted to challenge the visitors to lock their mobile phone and watch in a closet before attending the exhibition with the aim that the visitors would be more present in their tour of Sansour's artwork. As a part of the teaching throughout the course, we also discussed the balance of working with humour and provocation by not to exaggerate the use of these elements (Dunne and Raby, 2013). This point was also addressed in Paper 2. The examples of students' drawings show how they developed their own visual language relevant for their context (Qvist-Sørensen and Baastrup, 2019) and were inspired by others' work, which is

common in graphic and visual facilitation (Nielsen et al., 2016). Likewise, the development of a more humorous focus in my teaching was also inspired by my context of performing investigations in organisations, where the emergence of humour and visual metaphors was significant (Paper 2).

A final example of a *post-active form of teaching* (Goodyear, 2015) and a redesign of design experiments that is not explicitly addressed in the Papers is the introduction of drawing as a part of the students' context phase (see the DBR approach). In prior iteration of the design experiment in Paper 6, we introduced the students to the use of photos documenting their observations at the museum (the external stakeholder for the course). Inspired by my research stay at the Design School Kolding, I proposed the use of drawing in the context phase. My colleagues were open to the suggestion, and we then developed the teaching lessons to encompass the use of drawing in the context of the investigation. The redesign also supported the aim of this research project by positioning the students as *active drawers* at the beginning of the course. The redesign was also inspired by my own exploration of using drawing as a means of doing visual research (see section 5.1). Thus, the students were encouraged to use drawing as a part of their fieldwork at the museum in order to slow the pace of their observations, be curious, be present and use all their senses in their observations (Causey, 2017, pp. 19–22).



Billede 2: Tegning fra feltbesøg på MM

Figure 32: Drawing from an ethnographic fieldwork at Medical Museion, 2020
(credit: Rasmus Otto-Sidelmann)

Figure 32 shows a student's drawing from their ethnographic fieldwork at Medical Museion, Denmark, which was the external stakeholder in the design experiment in 2020. The more ethnographic approach to drawing might have allowed for more details and personal strokes from the students. Likewise, in the research team we started noticing that the student group placed examples of their drawings in the student reports and not only in their appendix.

As part of the prior iterations, I had previously experimented with the use of drawing on the first day of the context investigation, while students and teachers visited the museum. The purpose was to

capture utterances presented by the museum staff to concretise my drawing examples in relation to how the external stakeholders framed the students' challenge. In the early years of the design experiment, I typically showed a *presentation drawing* (Qvist-Sørensen and Baastrup, 2019) of my observations instead of showing my *rapid sketches* from my notebooks (Goldschmidt, 2003; Twersky and Suwa, 2009). It can be argued that I showed a more clean expression of the drawing focusing on the product more than the process (see also the dilemma discussed with graphic facilitators in Chapter 2), see Figure 33.

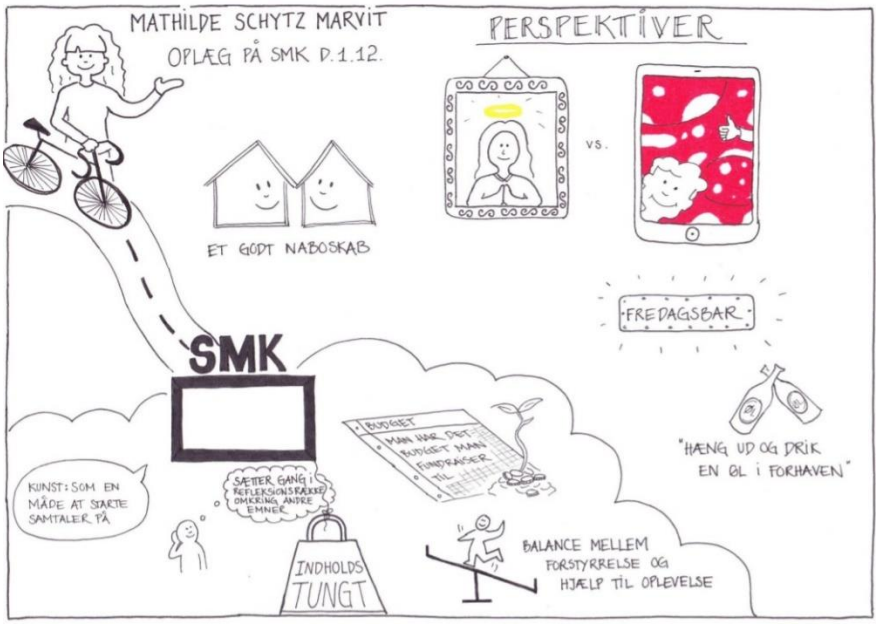


Figure 33: A neat presentation of my observations at a museum – context investigation

Figure 33 show an example of how I showed 'neat' drawings of my own observations from museum context (2015), where I had organised the main points I relation to each other. In relation to a didactical considerations from my context investigation, where graphic facilitators in their role as teachers explicitly 'draw ugly' to create a safe and explorative learning environment, I also started consider my own presentation of my context investigation. Since I wanted to show the process of my own context investigation, I also needed to show how my rapid drawings from my notebooks took form before ending up in a more clean version as a presentation drawing.

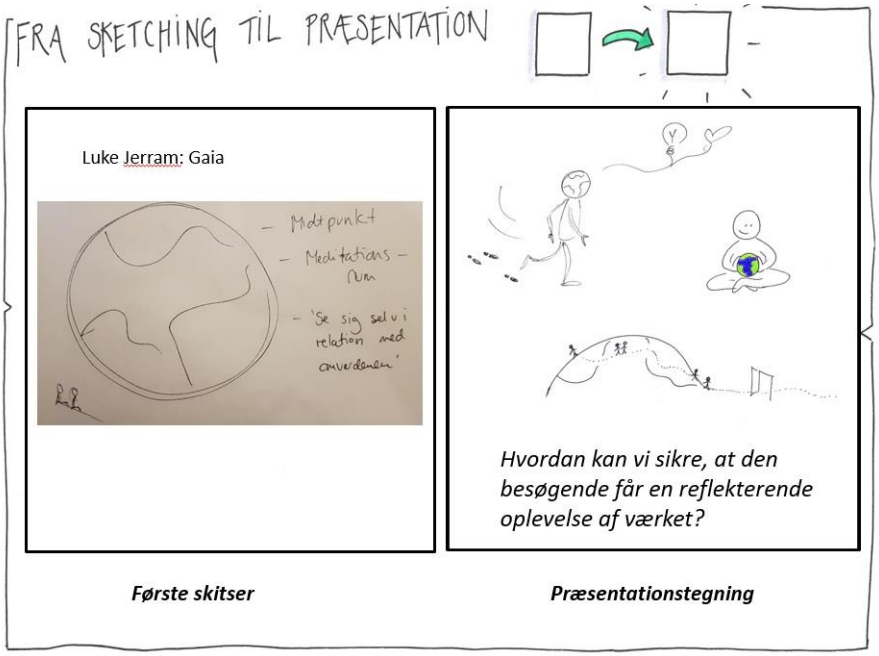


Figure 34: Rough sketch and a presentation drawing of my observation (2021)

Figure 34 and figure 5 in Paper 6 (Hautopp, 2021, p. 6913) show the process from my early sketches to the elaboration into a presentation drawings. Thus, these examples also allowed me to discuss the difference between using the drawings as an ideation and dialogue tool or presentation tool as described in Qvist-Sørensen and Baastrup (2019).

Year	**Collaborative stakeholder**	**Students' design challenge**	**Teaching activities, materials and technologies**	**Redesign/adjustments in educational design**
2015	The National Gallery of Denmark	Making the permanent exhibition more attractive to visitors	Teacher's use of a whiteboard to introduce analogue drawing techniques; *F2f teaching*	Introduction of theoretical foundation before drawing techniques
2016	The National Gallery of Denmark	Making a strategy for creating meaningful meetings between families with young children and the exhibition	Teacher's use of a whiteboard to introduce analogue drawing techniques; *F2f teaching*	Introduction of extreme sketching/humour in relation to critical design

2017	The National Gallery of Denmark	Making a strategy for creating a creative hub for the youth at the museum	Teacher's use of a whiteboard to introduce analogue drawing techniques; *F2f teaching*	
2018	The Danish Postal Museum	Making a strategy for user participation where visitors can get involved with the museum installation	Teacher's use of a whiteboard to introduce analogues drawing techniques; *F2f teaching*	• Introduction of drawing techniques *before* theoretical foundation • Introduction of design walls physically placed at location
2019	**International art centre, Copenhagen Contemporary**	**Making the exhibition "Heirloom" by Larissa Sansour more accessible to visitors**	**Teacher's use of a document camera to introduce analogues drawing techniques;** ***F2f teaching***	• **Introduction of mobile design walls** • **The use of a document camera for introducing analogues drawing techniques** • **Distribution of drawing exercises as a scanned pdf after introduction (see Appendix 1)** • **Introduction of animation-based sketching combined with visual facilitation**
2020	Medical Museion	Making the upcoming exhibition "The world is in you" inviting to visitors	Teacher's use of a document camera to introduce analogues drawing techniques; *Hybrid/online teaching*	The use of teacher-produced videos to support the online teaching
2021	Medical Museion	Making an after life of the exhibition "The world is in you" inviting to visitors to encourage revisits and further reflections	Teacher's use of a document camera to introduce analogues drawing techniques; *hybrid/online teaching*	-

Figure 35: Overview of adjustments and redesigns in the third design experiment (Paper 6)

Figure 35 show the different iterations of the design of the course Communication Design: Experiences, Time, and Space (10 ECTS), which is the course in which I did the most iterations and redesigns of the workshops. The year 2019 is highlighted because these are the redesigns analysed and discussed in Paper 6 (e.g., the use of the document camera, mobile design walls and animation-based sketching). Besides focusing on the teaching of visual methods, the paper also addresses the assessment of these

methods. Due to the COVID-19 pandemic over the last couple of years, we had to redesign the course for an online setting. Without going into a thorough analysis of the last two iterations of the course, I wish to emphasise that we as teachers produced videos introducing the theories in relation to the students' design challenges and the exercises of the lessons. Thus, we drew on prior experiences from the design experiment in Paper 4. Likewise, my use of a document camera in this design experiment also relied on prior experiences from the design experiment in Paper 5. From a DBR perspective, these overlapping processes show that design experiments can benefit from multiple iterations across contexts (Anderson and Shattuck, 2012).

5.3. Exploration of drawings as a means of presenting research

In this section, I address how I explored the use of drawings as a means of presenting research. Moreover, I elaborate on why I chose to do so. Firstly, when the research object revolves around drawing, it becomes evident that the research needs to be represented in a form that reflects the content (Leavy, 2020). Secondly, based on my pragmatic inquiry, I also wanted to show the process of knowledge production, in which the act of drawing and writing support each other (Section 3.2). Below, I present a few examples of the conversation between my drawing and writing.

I struggled to frame the research project in the introduction of this dissertation. Therefore, I tried out numerous different drafts in writing. However, I finally had a breakthrough when I drew the title as presented in Section 1.8: Why this title for the PhD project?, with each sentence underlined in a different colour. This drawing sparked my idea to outline the background for the title and significant aspects of the research project. I went into a backtalk (Schön, 1983; Goldschmidt, 2003) with the drawing, which helped me to structure the writing of the introduction.

Another example, presented in Figure xxx, is how I progressed from an initial drawing made during my participatory observation of one of the basic graphic facilitation courses. At the end of the course, the teacher asked us to reflect on what we had learned from the course. I wrote and drew: "*[I have] learned about the Lazy Netflix B*".

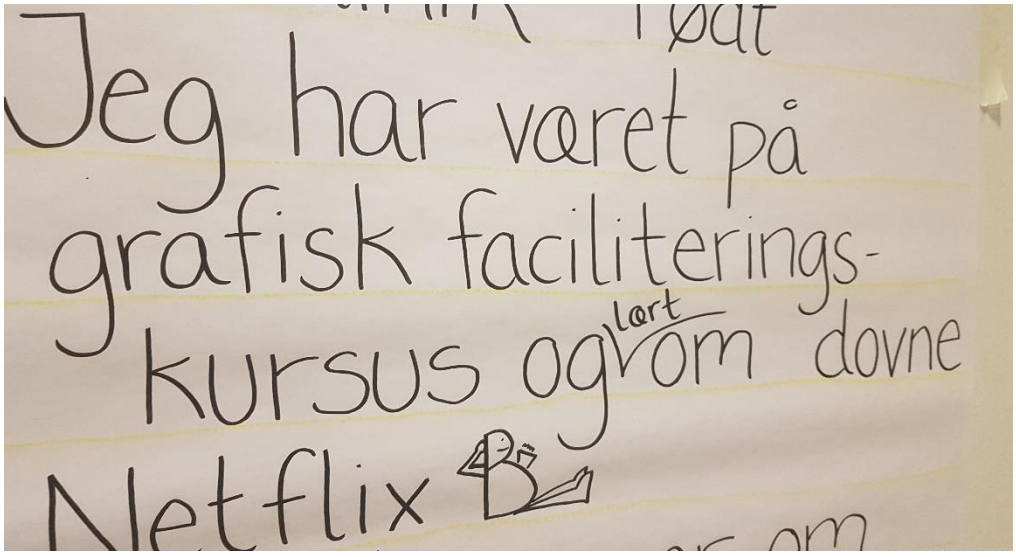


Figure 36: My initial sketch drawing of the Lazy Netflix B – fieldwork 2018

This was a way for me to reflect on the course content and illustrate a significant experience from the course, which I later reflected on theoretically: the emergence of humour and visual metaphors throughout the course. As shown in Paper 2, I discussed my preliminary findings with the teacher and theoretically reflected upon the observations in the analysis. This abductive approach to the analysis is further elaborated in Chapter 6.

Paper 2 includes a presentation drawing of the Lazy Netflix B (see Figure xxx), which was also used when I presented my preliminary findings as part of the PhD course 'Understanding Play – Designing for Emergence' at Design School Kolding, Denmark in February 2021 and afterwards at the Design for Learning Conference 2021.

Figure 37: Presentation drawing of the Lazy Netflix B

During the PhD course, I received peer feedback that the playful strokes in my drawing supported the analytical point about how the combination of humour and visual metaphors is built up as social memories (Ivarsson, Säljo and Linderoth, 2009). Based on the feedback from the PhD course, I presented on the use of drawings at the Design for Learning Conference, where I also received positive feedback on the 'hand-drawn' style of my presentation.

The final example in this section is taken from the collaborative writing process in Paper 3, in which we went from a presentation drawing to a dialogue drawing to a presentation drawing again.

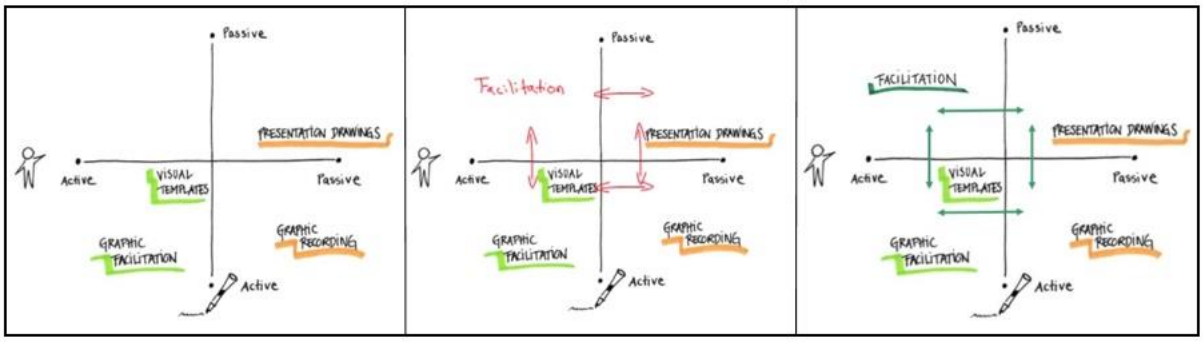


Figure 38: A visual presentation of the roles of a graphic facilitator (Paper 3)

Figure 38 from Paper 3 is an example of switching between drawing as a presentation tool when presenting certain information to a dialogue tool when using the drawing to structure a discussion (Ovist-Sørensen and Baastrup, 2019, p.152). The version in the middle with the red pen was used to discuss an analytical point about the lack of facilitation focus in the research literature on graphic and visual facilitation, which we decided to add as a final result in the study. Thus, the drawing was first used to present an overview of the different formats within graphic facilitation (e.g., graphic facilitation, graphic recording, visual templates and presentation drawings). Then, the drawing was used to show our contribution to the analysis.

In summary, the act of drawing served several purposes in relation to the knowledge production and writing of this dissertation. I used drawings to initiate the writing process, to represent analytical points and findings in the papers and in conference presentations, and as a dialogue tool with fellow researchers to discuss and develop the analysis.

Research ethics

In all research project, it is relevant that the researcher take ethical issues into considerations (Creswell, 2012). As outlined in the Papers, I have gained permission from the participants to observe the teaching, exams and record interviews. Furthermore, when I work with visual materials, it is crucial to get consent from participants, if I use their visual productions or they appear in photographs presented in the dissertation (Rose, 2016, p. 362-363). Sometimes I have re-created drawings to capture analytical points and observations from fieldwork (e.g. in Paper 2) and other times I have asked for specific content to use drawings from participants (e.g. section 5.1) or from other graphic facilitators (e.g. section 5.2). In the examples, where I refer to specific titles and names, the participants have given their consent.

Chapter 6: Theoretical perspectives

In this chapter, I will present the main theoretical perspectives used in the research project. The perspectives revolve around learning and design. As outlined in Chapter 3. *Research approach*, the theories are seen as tools to use to reflect and elaborate on practice-based experiences (e.g. Dewey, 1922; Brinkmann, 2012). Thus, the chapter ends by describing my abductive approach to analysis.

6.1. Learning perspectives

To outline pragmatic learning perspectives in this research project, I will draw on perspectives from Donald Schön's book (1983) *The Reflective practitioner - how professionals think in action*. As mentioned in section 1.1., Schön takes a point of departure in the architectural field where he describes the reflective design processes, which an architect inter when developing new design ideas. Furthermore, he broadens these perspectives to include other kinds of professional practice where practitioners often work with complex situations and problems. Overall, I draw on these perspectives when I analyse the participants' (teachers, trainees and students) interactions with materials and each other as a part of their work with graphic and visual facilitation. Through participatory observations and interview situations, I gain access to knowledge about the participants' reflections and learning processes about concrete situations from their daily lives. Thus, I ask participants to bring visual examples and photographs of how they have worked with graphic and visual facilitation to encourage a conversation grounded in their experiences (Schön, 1983).

When photo elicitation is used as a method to enhance interview situations, there is an aim to place participants in a situation where they through visualisations are prompted to *reflect* upon their own practices. As the graphic and visual facilitation practice revolves around the act of drawing, by introducing drawings from their practice in the interview situation, the purpose is to *honour knowledge grounded in experience* (Wang, 1999, p. 86). When interview situation is the chosen way to get access to the participants' reflections about their learning processes, the following section will relate Schön's theoretical perspectives to the specific interview situations conducted in the research project.

The theoretical point of departure for discussing the reflective processes the participants enter into in the interview situation is inspired by Schön's concepts of reflective processes (1983). Schön elaborates that our actions in everyday life are typically tacit, implicit in our patterns of actions and in our feeling for the things with which we are dealing. He refers to this as our *knowing-in-action* (Schön, 1983, p. 49). At the same time, Schön emphasises that we often think about what we are doing while we are doing it. He refers to these thinking processes as *reflection-in-action*: "*It is this entire process of reflection-in-action which is central to the 'art' by which practitioners sometimes deals with situations of uncertainty, instability, uniqueness, and value conflict*" (Schön, 1983, p. 50). The various participants in the research project have different levels of expertise and roles regarding graphic and visual facilitation:

- The participants (Paper 3) in my study had all been introduced to some new drawing techniques and facilitation practices to use in their work contexts, so it was interesting to see how they perceived and experienced these ways of working when reflecting on their *knowing-in-action* and the stuff at hand (Schön, 1983).

- The teachers (Paper 2) had long expertise in doing graphic and visual facilitation and teaching the method. Thus, it can be argued that they had a lot of *knowing-in-action* regarding this way of working. It was interesting to get them to illuminate and verbalise their didactical considerations regarding their organizing of teaching where they also reflected-in-action during their teaching sessions.

Schön states that *reflection-in-action* is a contradiction in terms: "*According to conventional wisdom, thinking interferes with doing in two ways. First, artistry being indescribable, reflection* ***on*** *action is doomed to failure; and second, reflection-****in****-action paralyzes action. Both arguments are largely, though not entirely, mistaken. They owe their plausibility to the persistence of misleading views about the relation of thought and action*" (Schön, 1983, p. 276).

Schön points to the importance of practitioners' intuitive understanding of practice as reflection-in-action, which can be described in words. However, there is always a gap between such descriptions and the reality to which they refer (Schön, 1983, p. 276). Furthermore, a practitioner's reflection-in-action is bounded by the "action-present', the time zone in which action can still make a difference. Schön describes these kinds of reflections and experimentation as the practitioner's "on the spot experiment" (Schön, 1992, p. 16). Likewise, he emphasises that the action-present may stretch over minutes, hours, days or even weeks or months, depending on the pace of activity and the situational boundaries that are characteristic of the practice (Schön, 1983, p. 62). Schön further elaborates that in many cases there is time to think about what we are doing, especially when the practice evolves over time (Schön, 1983). These reflection processes can be characterized as reflection *on* action, but with the pragmatic notion of not detaching thinking and action (Dewey, 1922). Schön gives the example of professional athletes who seldom "thinks" during a game, but reviews film of the game afterwards, reflecting on their actions they took during the game (reflection *on* action) (Schön, 1983, p. 278).

I will argue that the interview situations in my research project have similarities with the athletes' review of the game situation. I invited participants to review situations from their work contexts where they either used graphic and visual facilitation as a new way of working, e.g. when trainees implemented the practice in their daily work (elaborated in Paper 3) or when they (the teachers) reflected upon their teaching practices regarding graphic facilitation (elaborated in Paper 2). In my research, I characterise the working situations where participants and teachers use graphic and visual facilitation as bounded by the "action-present", which relies on participants' and teachers' knowing-in-action. Likewise, these work situations demands for reflection-in-action, while the trainees and teachers do "on the spot experiments" and adjust their use of drawings in the situations. In order to get access to the participants' and teachers' reflective practices regarding their review of the situations, I took an active part as a researcher by doing the following two things:

- Paper 3: In this study, I prompted the participants to bring drawings into the interview situation. The purpose of this was to open up for their tacit knowledge and *reflection-in-action* about the specific situation in which the drawings were used. Likewise, the interview situation guided the participants' broader *reflection on action* in relation to how they perceive and experience their use of graphic facilitation in their work contexts. In the specific interview situation, the drawings were used to prompt recall (Pink, 2011) of the trainees' "action-present", where they reflected on and elaborated their use of drawings in e.g. meetings and workshops in their organisational contexts.

- Paper 2: In this study, I brought my own annotated drawings into the interview situations as an elicitation method to trigger the teachers' memories of the teaching situations. The aim was to make the teachers illuminate their didactical considerations in relation to some concrete examples from the teaching situations. As in Paper 3, the interview situation guided the teachers' broader *reflection on action* in relation to how they perceive and experience their teaching in graphic facilitation.

In a broader perspective, the interview situations in both studies can be viewed as the participants' ongoing reflection *in* action regarding the use of graphic facilitation in their work contexts where the action-present stretches over months and years (Schön, 1983). The abovementioned examples are concretised based on the empirical data from Papers 2 and 3. However, the perspectives are also considered relevant in relation to students' reviews of the use of visual methods in design processes in Papers 4, 5 and 6 as well as an examiner's reflections regarding the assessment of students' designerly and creative ways of working in higher education in Paper 6. Here, I also presented the examiner with concrete examples from exam situations that made her reflect upon her own role in encouraging students to actively bring visual materials into the dialogue in exam situations. As I see myself as a reflective practitioner and researcher exploring the field of graphic and visual facilitation, it can be argued that I enter the same kind of reflective processes regarding my own inquiry. Thus, in a meta-perspective, my actions rely on my knowing-in-action, where I do 'on-spot-experiments' when carrying out the design experiments and primarily reflection-on-action in the post-active forms (Goodyear, 2015). Examples of my reflection-on-action were presented in section 5.2.

I consider Schön's theoretical perspectives as significant in identifying different reflection processes that participants, teachers and students go through during their work with graphic and visual facilitation. However, sometimes there is also a need to add other theoretical perspectives in relation to *what* these reflective processes encompass. From a pragmatic perspective, I used different theories to reflect on emergent patterns in the empirical data (Brinkmann, 2012). During the research process this led to the selection and implementation of other theoretical perspectives, e.g. derived from a literature review on impact, value and effect in graphic and visual facilitation (Paper 3) to relate perspectives from other studies to the reflection processes of the participants in our study. Furthermore, theoretical perspectives derived from the field of play and humour (e.g. Bateson, 2014; Banas et al., 2011) and a sociocultural approach to multimodality in reasoning (Ivarsson, Säljo and Linderoth, 2009) have been used to analyse the emergence of collaborative developments of humorous visual metaphors in teaching graphic facilitation (see further analysis in Paper 2). Likewise, two social perspectives on learning processes were introduced and used in Paper 5 (Wenger, 2000; Fenwick and Landri, 2012) to discuss the students' collaborative meaning-making in groups. In order to theoretically discuss teaching situations of graphic facilitation, I draw on Goffman's framing analysis (Goffman, 1974; Lantz-Andersson, 2009). This perspective led me to understand the dynamic interactions between teacher, participants and visual materials in the basic graphic facilitation courses. From Goffman's perspective, I focused on microanalysis of the social interactions and how the meaning-making were generated within the groups (Goffman, 1974). This focus on meaning-making has also guided my analysis of the visual practices as outlined in Paper 5. Based on Pauwels and Mannay's approach to visual research (2020), I prioritise a process-oriented approach where I focus on the students' social interactions around the drawing activities (the production and utilisation phase) instead of a focus on the product (the visual artefacts). A more thorough focus on the student's drawings and prototype would probably have provided an interesting analysis. However, in line with

the the process-oriented focus in graphic and visual facilitation (cf. Agerbeck, 2012), I will argue that an analysis of the visual artefacts themselves might have signalled a misleading focus on aesthetic expression, which would go against the message in the field about not focusing on artistry (Valenzia and Adkins, 2009). On the other hand, I was interested in the students' reflections on the use of drawing and sketching techniques as part of their design exploration in groups (Schön, 1983).

6.2. Design perspectives

In this section, I will outline pragmatic perspectives related to the students' *design exploration* in groups. As previously mentioned, a connection between the work of a designer and a practitioner in other professions can be drawn (Schön, 1983). Furthermore, the connection between reflection and learning processes described in the previous section can be related to the way a designer enters a reflective conversation with the situation and the material at hand. In several of the papers and in section 5.2. *Exploration of drawings as a means of developing educational designs*, the connection between graphic and visual facilitation and design sketching is described and explored. Thus, the section below will present a brief introduction to design as a reflective conversation with the situation (Schön, 1983), which are further elaborated elsewhere in the dissertation.

As mentioned in the introduction, graphic facilitation is rooted in inspiration taken from the way architects and designers work visually (Sibbet, 2001). To explain reflective processes among practitioners, Schön draws on specific examples from the architecture field. He describes how designers and architects *make things*. Sometimes they make a final product, and other times they make a representation: a plan, a program or image of an artefact to be constructed by others (Schön, 1983, p. 78). The iterative process of making things is usually materialized through different sketches, which serve the dual purpose of externalizing ideas and turning thoughts into public discussion (Twersky and Suwa, 2009). Schön addresses how the process of sketching can be viewed as a reflective conversation with the situation where the situation 'talks back' (Schön, 1983, p. 79) – a perspective which is further discussed by architect and researcher, Gabriella Goldschmidt (2003), in her paper "The backtalk of self-generated sketches". Goldschmidt emphasises how the act of sketching can be viewed as a modulator of problem space where designers can discover new properties and relations that emerge from the sketch but were not intentionally put there (Goldschmidt, 2003; Twersky and Suwa, 2009). Olafsson and Sjölen (2007) describe four different design genres which designers can enter: *investigate, exploratory, explanatory and persuasive.* These genres have different purposes in the iterative design process starting from ideation and discussing ideas internally in the design team (investigative and exploratory) to explaining design ideas to stakeholders outside the design team (explanatory) to selling the design concept in a marketing context (persuasive). In the papers, the sketching perspectives were combined with perspectives on graphic and visual facilitation as dialogue and presentation tools (e.g. Qvist-Sørensen and Baastrup, 2019). Thus, I investigated my working hypothesis in the research project: *a combination of graphic and visual facilitation and sketching can provide an operationalisation of pragmatic inquiry perspectives for humanities students to enter design exploration in higher education.* Furthermore, this combined practice was explored in relation to supporting the development of digital prototypes (Buxton, 2007) and animation-based sketching prototypes (Vistisen, 2016).

Based on the design perspectives above, the act of sketching can serve different purposes of both individual and collaborative idea generation as well as the presentation of ideas to external partners.

As this research project takes a point of departure in a pragmatic approach to knowledge building, I have addressed concrete ways in which I have been working with the connection between graphic and visual facilitation and sketching in Chapter 5. To explore the connection, I developed design experiments (Cobb et al., 2003) to encompass this connection, which I have further explored in an ongoing inquiry process by conducting a retrospective analysis of the data sets generated during the design experiments (Cobb et al., 2003, p. 9). The preparing of the design experiments was described in section 5.2. *Exploration of drawings as a means of developing educational designs*. Furthermore, the analysis of the design experiments can be found in Papers 4, 5 and 6, where main points and connections between the papers will be addressed in Chapter 8. Based on the twofold function of DBR, I consider the theories as equally relevant, when describing my own inquiry process and the students' inquiry processes and design exploration during the design experiments. Thus, these design perspectives were also introduced to the students at the different courses (see Papers 4, 5 and 6).

Although there are many similarities within design practice and graphic and visual facilitation practices, there are also differences, e.g. the process- vs. product-oriented focus as described in section 2.3. Furthermore, a difference that I see between design practice and graphic facilitation practice is in relation to 'time'. The designer typically starts individually and then presents ideas to others later, e.g. to a teacher (Schön, 1983) or to other design team members (e.g. Goldschmidt, 2003; Twersky and Suwa, 2009) or external stakeholders (Olafsson and Sjölen, 2007). Based on the pragmatic description of the mode of back-talk, I will argue that both in design and in graphic facilitation the drawer switches between thinking and dialogue – ideation and presentation. However, in graphic and visual facilitation the external presentation to team members or external stakeholders is implicit in the activity of drawing the ideas. Thus, when you draw, you simultaneously engage in dialogues with others around the drawings. Here, a key difference between the two drawing practices can be found.

6.3. Abductive analysis – connecting theory and practice

When I take a pragmatic approach to analysis of the qualitative data, it is also constantly relevant for me to consider and reconsider my use of theory to reflect my personal experiences. In section 6.1. I have described how Schön's theoretical perspectives were supplemented with other perspectives derived from the practice-based experiences. Thus, the use of theories was informed by the emergent patterns in the empirical data (Brinkmann, 2012). In the papers, inspiration from thematic analysis is outlined (Braun and Clarke, 2006) as an approach to identifying, analysing, and interpreting patterns of meaning ('themes') within qualitative data (Clarke and Braun, 2017). Thematic analysis can be used to identify patterns within and across data in relation to participants' lived experiences, views, perspectives and practices; it is an approach that "*seeks to understand what participants' think, feel and do"* (Clarke and Braun, 2017, p.297). In my research, there is also a focus on getting insights into participants' thoughts, feelings and actions regarding the use of graphic and visual facilitation in their daily work. Clarke and Braun (2017) argue that identified themes provide a framework for organising and reporting the researcher's analytical observations. When I take a DBR approach, it is also relevant to include participants in a collaborative analysis of data (Barab and Squire, 2004). As Brinkmann notes: "*Humans are not just causally reacting entities, but acting persons that can often give accounts of what they do and may try to justify their actions*" (Brinkmann, 2012, p.21). In the analytical process, I also draw on inspiration from abductive reasoning in a back and forth movement between practice and theory, iteratively acquiring new knowledge regarding the research object.

Abduction is a form of reasoning that is associated with the pragmatic approach to knowledge building that is employed in situations where we need an understanding or explanation of some effects (Brinkmann, 2012). Tavory and Timmermans (2014) ask the question "*how do we create an environment conducive to the discovery and explanation of unexpected findings*"? (p. 5.). From a pragmatic perspective, they advocate for an abductive approach to analysis. They further elaborate that theory generation requires us to move away from our preconceived notions and to create new narratives about the phenomenon we are trying to explain (Tavory and Timmermans, 2014). An example of this approach is when I invited teachers and the examiner into an analysis of my preliminary analysis of their respective teaching and examination practices. Here, the movement back to practice enhanced my knowledge about what the participants were thinking and feeling (Clarke and Braun, 2017) in the situations that I have observed. Thus, the preliminary patterns observed from my perspective were collectively analysed, and I discovered e.g. new didactical consideration, which I could not have extracted from the observed patterns myself. Thus, I was able to create new narratives about the teaching of graphic facilitation (Paper 2) and the students' use of visual materials in exam situations (Paper 3). It can be argued that, to enhance the understanding of the students' approaches to visual materials in the exam situation, it could have been relevant to interview them afterwards based on my observations. Thus, I could have created spaces for the students' to reflect on their own exam practices (Schön, 1992).

Chapter 7: Presentation of Papers

Based on the research question and the research approach within Design-based research, six original papers are included in this dissertation to represent the research undertaken. The six papers cover different angles and analysis of the research area and thus contribute to the investigation of the research question. As outlined in the introduction and in Chapter 4, organisational and higher educational contexts are the focus areas of this research project. Thus, Papers 1, 2 and 3 are especially produced with the purpose of investigating the first part of the research question: *How is graphic and visual facilitation being practised?*. Whereas Papers 4, 5 and 6 consist of the development and analysis of design experiments in higher educational contexts, especially with the purpose of exploring the last part of the research question: *How can graphic and visual facilitation support design exploration in higher education*?

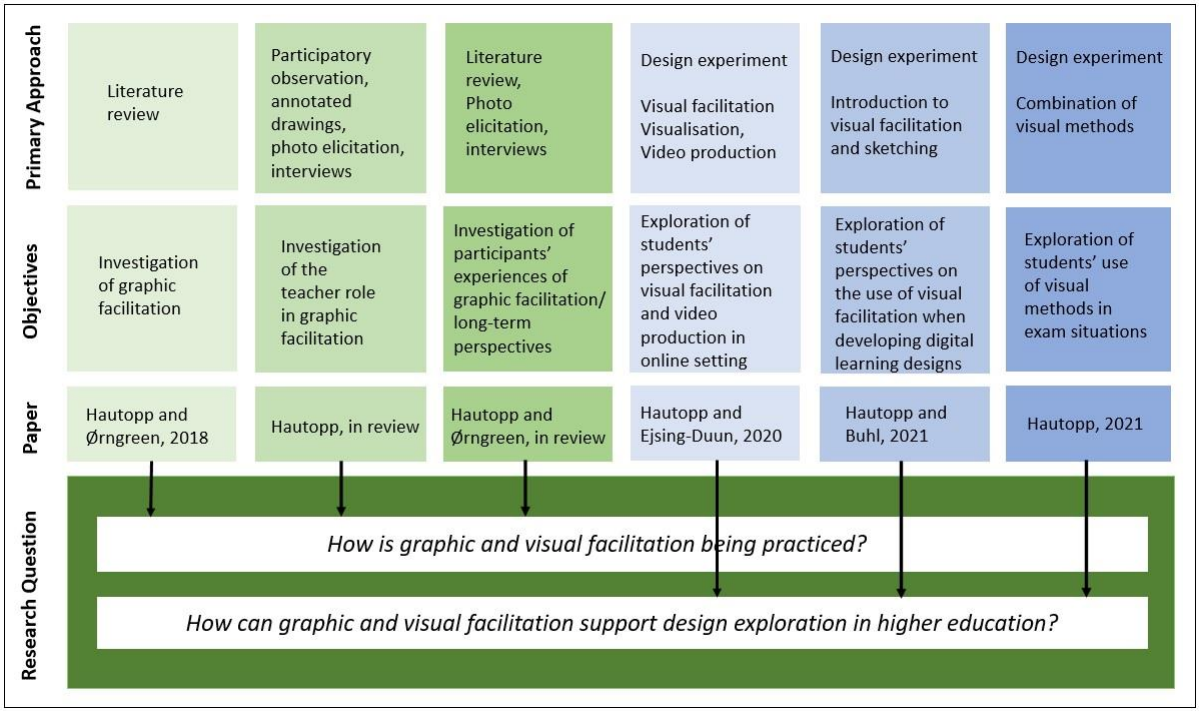


Figure 39: Overview of the papers and how they relate to the research questions

Figure 39 shows the objective of and the primary research approach taken in each paper. Furthermore, the figure shows how the papers feed into the exploration of the two parts of the research question with the purpose of answering the overall research question: *How is graphic and visual facilitation being practised and how can graphic and visual facilitation support design exploration in higher education?*

In this chapter, I will give a short presentation of each paper followed by the papers themselves. The six papers published or submitted throughout this research project are as follows:

- Paper 1: Hautopp, H., and Ørngreen, R. (2018). A Review of Graphic Facilitation in Organizational and Educational Contexts. *Designs for Learning*, *10*(1), 53–62. DOI: http://doi.org/10.16993/dfl.97 (published).
- Paper 2: Hautopp, H. (2022). The Lazy Netflix B: An Ethnographic Study on the Use of Humour and Visual Metaphors in Teaching Graphic Facilitation (under 2nd round of review by *Journal of Designs for Learning*).
- Paper 3: Hautopp, H., and Ørngreen, R. (2022). From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees (submitted for review by *Journal of Visual Communication*).
- Paper 4: Hautopp, H., and Ejsing-Duun, S. (2020). Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study. *Electronic Journal of E-Learning*, *18*(5), 373-386. https://doi.org/10.34190/JEL.18.5.001 (published).
- Hautopp, H., and Buhl, M. (2021). Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education. *Electronic Journal of E-Learning*, *19*(5), 321-335. https://doi.org/10.34190/ejel.19.5.2466 (published).
- Paper 6: Hautopp, H. (2021). The process from teaching to assessing students' designerly and creative ways of working in higher education. In: *Proceedings of ICERI2021 Conference 8th-9th November 2021* (p. 6906-6924). International Association of Technology, Education and Development (IATED) (published).

The original publications are included in this chapter without alterations to the content or original layout. The presentation of the papers will lead up to Chapter 9. *Conclusion - connecting the lines*, where I will summarise the contributions across the papers in relation to the research question before concluding and providing further perspectives.

Paper 1: A Review of Graphic Facilitation in Organizational and Educational Contexts

Paper 1: Hautopp, H., & Ørngreen, R. (2018). A Review of Graphic Facilitation in Organizational and Educational Contexts. *Designs for Learning*, *10*(1), 53–62. DOI: http://doi.org/10.16993/dfl.97 (published)

The first paper presented is a literature review within the field of graphic facilitation. Thus, the paper is a position paper which frames the initial research area and focus in this research project. From the literature review, we could conclude that there is a scarcity of research within this field, which positions the research project in a research gap. The paper highlights characteristics within graphic facilitation and ends by making suggestions for further research, which have laid the direction for the rest of the research project. Furthermore, in the paper we outline potentials for drawing connections between the field of graphic facilitation and other research areas, especially the research area in design. In relation to the DBR approach of the research project, this literature review plays a crucial role in answering the first part of the research question: *How is graphic facilitation being practised?*

The first paper was the stepping stone for further exploration of the research area, asking new questions about the subject. At the same time as the literature review, I did ethnographic fieldwork as elaborated in Chapter 3. Research design. Thus, after the publication of this paper, it became crucial to include the term 'visual facilitation' in the research project as elaborated in sections 1.7. and 2.5. Thus, the research question was expanded to include both terms: *How is graphic and visual facilitation being practised?*

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A Review of Graphic Facilitation in Organizational and Educational Contexts

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RESEARCH

A Review of Graphic Facilitation in Organizational and Educational Contexts

Heidi Hautopp and Rikke Ørngreen

Graphic facilitation is a growing practice in organizational contexts and is slowly emerging in educational contexts. However, as the review in this paper shall demonstrate, there is a shortage of research in the field. The purpose of this paper is to illustrate the practical application of graphic facilitation with the aim of outlining a suggestion for future research in relation to educational and organisational settings. Based on our review, we turn to related research areas, in particular design sketching, but also social learning theories and problem-based learning. We describe and exemplify how these related research areas can expand research perspectives on graphic facilitation, its use, processes, and outcomes and the roles of the participants involved.

Keywords: Graphic facilitation; literature review; sketching; digital possibilities; learning; collaboration; education and organization

Introduction

Graphic facilitation was initiated in the 1970s by David Sibbet and Geoff Ball, who used graphics to support group processes in organizations. In the 1980s, Ball (1999) stopped working with graphic facilitation, while Sibbet continued the practice in his company The Grove. Graphic facilitation is often used to describe what professionals do when visually representing group processes (Sibbet, 2001; Tyler, Valek and Rowland, 2005). The method was initially inspired by the ways in which designers and architects utilize visualizations and sketching with clients (Sibbet, 2001, 2008). In the field of graphic facilitation, analogue drawing techniques are referred to as the typical way of doing graphic facilitation, whereby the facilitator draws on large pieces of wallpaper while involving participants and using their utterances to visualize and organize what is said (e.g., Sibbet, 2001; Tyler et al., 2005; Valenza and Adkins, 2009). Often, practitioners who utilize graphic facilitation refer to a process whereby, as facilitators, they carry out the graphic illustrations in-situ, combining words and pictures based on the participants utterings during the facilitation process (as shown in **Figure 1** below). Thus, graphic facilitation is interpretive, as the graphic facilitator listens to the story in the conversations, translating verbal and nonverbal inputs into visual forms that serve to synthesize and integrate individual and group thinking so as to focus and direct group processes (Tyler et al., 2005). Leading Danish consultants in graphic facilitation emphasize that interactions between participants as well as with the graphic material produced during the sessions constitute the core of graphic facilitation (Nielsen et al., 2016).

As this paper seeks to demonstrate, graphic facilitation is a growing practice, but research-based knowledge on the method's application, steps, and effects remains scarce (Nielsen et al., 2016). The aim of the paper, therefore, is to present a review of the existing literature in order to point to potentials and barriers in graphic facilitation processes and future developments of the method, particularly as it relates to the field of design and learning in organizational and educational contexts. Through this review, we found various factors at play and conclude that there is a need for more systematic empirically based research that focuses on how to use graphic facilitation as support for learning, reflection, and knowledge creation in groups, with a particular focus on digital possibilities.

Graphic facilitation – Application in practice and as a research field

Graphic facilitation is derived from practices by consultants who have deployed designs and other creative methods as problem-solving strategies in business (Sibbet, 2001). Since its initiation in the 1970s, the method has expanded globally, but it is still a relatively new phenomenon in Scandinavia (Nielsen et al., 2016). In 2003, graphic facilitation was introduced in Denmark by Ole Qvist Sørensen, a former employee at David Sibbet's company The Grove, who had returned to Denmark to start his own company Bigger Picture (Qvist Sørensen, 2017).

In the Scandinavian context, and inspired by David Sibbet and Ole Qvist Sørensen, the book by Nielsen et al. (2016) was authored in collaboration between

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Figure 1: A graphic facilitation process seen from the position of the participants (source: photo by author R. Ørngreen, of author H. Hautopp in an ongoing facilitation process).

organizational consultants from the company Attractor, part of Mannaz and New Stories. Madsen and Frank's (2014) work is another Danish publication that targets facilitators focusing on graphic facilitation in education and team collaboration. Thus, methods within graphic facilitation are deployed in different organizational and educational contexts. Both publications focus on practices and exercises based on the consultants' own experiences. Therefore, they do not represent research-based knowledge, in the sense that the experiences are not collected as empirical data that consider the full body of experiences and are not scientifically analyzed, cross-related, etc. They do, however, rely on theories of visual thinking (Horn, 1998; Hyerle, 2009) and systemic facilitation practices, which are a leadership practice applied, for example, within coaching, where the concepts of observing relations and communication patterns in groups are at play (Moltke and Molly, 2009). Likewise, various international hands-on books have been published within the field of graphic facilitation, e.g., *Visual Meetings* (Sibbet, 2010), *Visual Teams* (Sibbet, 2011), *Visual Leaders* (Sibbet, 2012), *The Graphic Facilitator Guide* (Agerbeck, 2012), and *The Art of Business Communication* (Shaw, 2015) as well as practice descriptive papers (Kelly, 2005; Valenza and Adkins, 2009).

It seems that the publications in-use about graphic facilitation are primarily in the form of practitioner guides, and only few research-based studies exist. In order to get a broader insight into the field of graphic facilitation, we conducted a more systematic literature review search using Harzing's Publish and Perish software (Harzing, 2010: 135–146) and employed the queries: "graphic facilitation" OR "graphic facilitator" for the period 1988 to 2018. This led to 682 results. To be more specific, we only addressed publications that explicitly applied the terms "graphic facilitation" and "graphic facilitator."

Literature review searches are often filtered through journal papers, as opposed to grey research, as books, anthologies, and conference proceedings and searches are filtered according to the number of citations, as opposed to the Google Scholar relevance link (e.g., in the review of design-based research in educational design in Anderson and Shattuck, 2012). In order to acquire a picture of which literature is in use, there is a need to investigate the body of literature referenced by others. However, omitting grey literature (e.g., conference papers, anthologies, and books) and research with fewer citations can prove to be overly limited, as the criticism of the otherwise much-cited Anderson and Shattuck (2012) review shows (McKenney and Reeves, 2013). In our situation, with an apparently small literature base, and even fewer scientific journals, we argue for the use of the Harzing software (which is based on a Google Scholar database), as scientific databases (Web of Science, etc.) can limit journal results. Furthermore, to qualify for the review, we have added a backward and forward snowballing approach (Wohlin, 2014), that is, investigating which references are used in the much-cited literature and then conducting a search of who else has used the same references.

Of the 682 results generated, 128 have been cited more than 10 times and 44 more than 50 times. In the list, many entries turned out to be either related to medical use, where facilitation was about aiding patients, or about language learning, where graphic facilitation was about learning from pictures rather than or as a supplement to the written words, or, for example, learning Chinese

signs. Neither of these is related to the method of graphic facilitation discussed in this paper. Therefore, we have systematically worked through the complete list and paid particular attention to papers that have been cited more than 50 times. This left us with 20 papers and books (and other materials), 7 of which were journal papers. However, through our snowballing process, we found additional papers and identified the much-cited practice research, some of which have already been introduced at the beginning of this section.

In **Table 1** below, we have outlined the reviewed materials based on their genre and their focus on either education or organizational contexts.

Two significant findings can be observed in **Table 1**: 1) *empirical foundation* and 2) *graphic facilitation in relation to the research area in design.*

Empirical foundation

The review shows that graphic facilitation is a novel research area, with only 12 research-based studies, seven of which mention either the term graphic facilitation or graphic facilitator, but do not demonstrate how the method is used. The other research papers refer to concrete cases and empirical findings, but do not explicitly elaborate on the method, data collection, and analysis, with the only exception being Van der Lugt (2000). In this paper, the sketching and graphic facilitation sessions were videotaped, transcribed into protocols, and further analyzed based on the linkography method inspired by Goldschmidt (1996). Furthermore, research on graphic facilitation is only represented in relation to its inclusion in elementary school (Eppler, 2006). Likewise, graphic facilitation is mentioned for its inclusive role in relation to intercultural communication between employees/adults in organizations (Tyler et al., 2005). However, from a practice-based perspective, some studies emphasize the potential of the use of graphic facilitation at all levels of education (Madsen and Frank, 2014; Margulies and Maal, 2002). These insights call for more empirically grounded studies in both organizational and educational settings. It has become relevant for both settings to investigate the relation between concepts of learning and graphic facilitation in order to explore graphic facilitation as a boundary object and process of meaning making in the facilitation of learning processes. Here, other approaches to facilitation in various learning situations may shed further light on this relation, e.g., Savin-Baden's (2003) contemplation of the facilitation of problem-based learning (PBL).

Graphic facilitation in relation to research area in design

As mentioned earlier, graphic facilitation was inspired by the ways in which designers and architects utilized visualizations and sketching methods (Sibbet, 2001, 2008); however, there is only a mere mention of the relation, without further elaboration. Other papers link the relation between sketching and graphic facilitation in a process in which design teams brainstorm with an external graphic facilitator, who provides a collective graphic memory for the designers (Van der Lugt, 2000), and where the use of extreme sketching is combined with graphic facilitation workshops in organizations (Hautopp and Nørgaard, 2017). In this paper, we will further explore these connections with inspiration drawn from the use of sketching in design processes (Buxton, 2007; Olofsson and Sjölen, 2007), pointing to areas of research in this field and what needs to be addressed when contemplating sketching in graphic facilitation.

Table 1: Overview of the reviewed material.

Genre	Examples from education	Examples from organization
Research paper that applies graphic facilitation/graphic facilitator	Prosser and Loxley (2007) *Elementary school – focus on inclusion*	Hautopp and Nørgaard (2017) Tyler et al. (2005) Van der Lugt (2000) Van der Lugt (2002)
Research paper/chapter mentioning graphic facilitation/graphic facilitator, *but does not illustrate how it is used*	Cockell and McArthur-Blair (2012). *Higher education* Eppler (2006) *Higher education* Nissley (2002) *Higher education*	Bason (2016) Crane (1993) McCarthy and Eastman, (2013) Nelson and McFadzean (1998)
Practice guides (books and how-to papers and reports)	Madsen and Frank (2014) *Elementary schools* Margulies and Maal (2002) *All levels of education*	Agerbeck (2012) Atlee and Zubizarreta (2010) Bunker and Alban (2006) Justice and Jamieson (2012) Kaner (2014) Kelly (2005) Margulies and Maal (2002) Nielsen et al. (2016) Schuman (2005) Shaw (2015) Sibbet (2008, 2010, 2011, 2012)
Papers addressing the history of graphic facilitation (non-research paper)		Sibbet (2001) Valenza and Adkin (2009)

Bernstein (1996) developed the concept of *reconceptualization* to describe how "discourses" originating from one social site are reshaped to fit with the social givens of the new site, for example, in organizational and educational settings. This means that discourses are moved from the originating site of production to a pedagogic site (Bernstein, 1996). From this perspective, we are interested in how sketching practices are *reshaped* and used in graphic facilitation settings and how the reconceptualization can be further developed. In order to understand this relation between sketching and graphic facilitation, the current practice of *graphic facilitation* as well as the role of *the graphic facilitator* are outlined on the basis of the reviewed material.

In the following section, the results from the literature review are presented in three themes:

1. Graphic facilitation: analogue drawing techniques, icons, and models
2. The graphic facilitator: roles, responsibilities, and dominant concepts
3. Design sketching as a concept in graphic facilitation

Based on the themes, it became relevant to look at graphic facilitation in respect to learning, which will be followed by a proposal for new digital possibilities. The paper ends with an outline of a suggestion for research that draws on these related areas through reviews, empirical investigations, and organizing interventions that apply graphic facilitation to support learning processes in organizational and educational settings.

Graphic facilitation – Analogue drawing techniques, icons, and models

As mentioned in the introduction, in the field of graphic facilitation, analogue drawing techniques are referred to as the typical way of doing graphic facilitation, whereby the facilitator draws on large wallpaper while involving participants and using their utterances to visualize and organize what is said (e.g., Tyler et al., 2005; Sibbet, 2001; Valenza and Adkins, 2009). Visuals and drawing techniques are applied as tools that direct the process, which place demands on the techniques so that they can be quick and easy to draw (Nielsen et al., 2016). Icons help make abstract phenomena more concrete. They are characterized by being simple to draw, having a symbolic significance, and being familiar to both the facilitator and participants, while also ensuring that the communication at hand is addressed (Madsen and Frank, 2014). In every practice guide from the literature review (see **Table 1**), there were example of icons, templates, and how-to guides on how to develop a visual language when working as a graphic facilitator. Graphic facilitation is not about depicting reality; instead, it is about representing ideas and icons in relation to other ideas illustrated in real-time on the basis of participants' contributions (Valenza and Adkins, 2009). Graphic facilitation relies on known models and icons, e.g., "Group Graphics Keyboard" (Sibbet, 2008: 121), which contains familiar representations of icons and templates. These icons and templates are organized from simple to more complex graphic illustrations, which represent generic purposes that the facilitator can actualize (Sibbet, 2008). Qvist Sørensen from Bigger Picture developed "7 elements of graphic facilitation," which also contain simple icons that can be used to illustrate: "*people, places, process, speech, text, colour, effect*" (BiggerPictureVideo, 2013). Working in this field in the Danish context has made it clear that almost everyone who has participated in a course in graphic facilitation has learnt to draw Bigger Pictures' icons for a man by using a star icon – the so-called "star man" (see **Figure 2** below), which is inspired by Sibbet's star man (Sibbet, 2010; Kaner, 2014: 71). Likewise, several papers and how-to guides explicitly refer to Sibbet's work and models (e.g., Nielsen et al., 2016; Kaner, 2014; Schuman, 2005). Thus, these models and elements have gained widespread recognition among practitioners. The practices in these guides may be easy to grasp and learn (see, e.g., the large number of YouTube movies on templates and icons, such as Ullersted, 2015, and the aforementioned BiggerPictureVideo, 2013), but are not easily created in-situ. Icons and drawing techniques have to be learnt prior to the processes (Nielsen et al., 2016), which points to the competencies and roles of the facilitator, which we discuss in the next section.

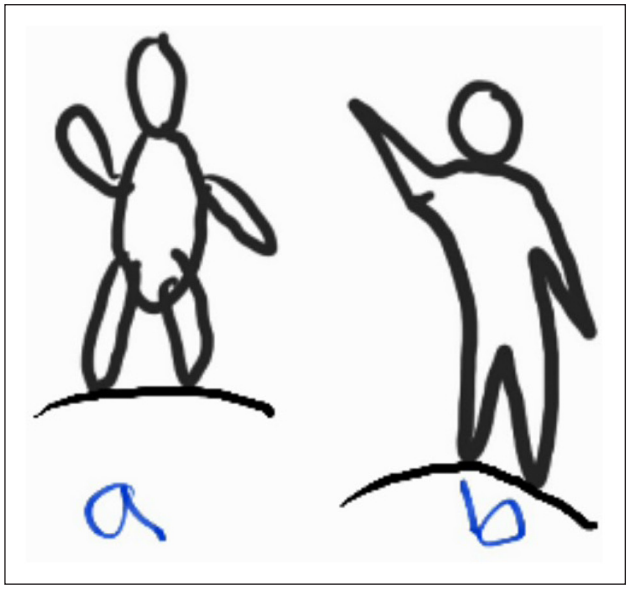

Figure 2: This figure illustrates two ways of drawing quick visualizations of a human. The first **(a)** is the classic abstraction of using symbols as a circle for the head, eclipse for arms, etc. However, even such an abstraction takes time to carry out in the very rudimental way shown, in particular, as it requires the drawer to lift the pen. The second **(b)** uses a different iconic solution, the "star man," which illustrates a human in a star-like shape. This is drawn quickly and can be done in one pen stroke, with the added possibility of giving the human different postures, movements, etc., faster than in the other version.
(Source: figure drawn by author R. Ørngreen).

The graphic facilitator – Roles, responsibilities, and dominant concepts

In the literature review, several papers and books refer to graphic facilitation as a concrete tool among other facilitation techniques, with the main focus being on facilitation (e.g., Justice and Jamieson, 2012; Schuman, 2005). Others use graphic facilitation as the main focus of their publication. In what follows, we shall especially highlight perspectives from the latter. In the papers by Tyler et al. (2005) and Valenza and Adkins (2009), there is a particular focus on the role of the facilitator in visually transcribing and documenting the process of a meeting or workshop, where participants are invited to comment on drawings during breaks and at the end of the sessions. On the basis of the definition by Nielsen et al. (2016), one may emphasize that the facilitator contributes by capturing significant bullet points from the process, based on his/her own interpretation at the moment, but plays a more passive role in the dialogue with the participants during the process. Thus, the process can be characterized as *graphic recording* (Nielsen et al., 2016: 25). When doing *graphic facilitation*, visual notes are used as an active and integral part of the process, e.g., during the workshops and in debriefings with participants (p. 26). In graphic facilitation processes, the participants have a more explicit influence on how processes are visualized, but typically, they are not actively drawing on their own. Nielsen et al. (2016) recommend exercises in which participants draw keywords as part of the process in order to be aware of the facilitators' *definition power* with the pen at hand (Nielsen et al., 2016: 220).

From this perspective, it would be relevant to look for other examples in which visualizations have been used, with professionals reflecting on their own practice (Nevgi and Löfström, 2014; Espiner and Harnett, 2016). A case study by Nevgi and Løfström (2012) investigated how academics at university use drawings to reflect on their roles as teachers. The authors emphasize that drawings paved the way for a space in which the academics were motivated to see new perspectives and to explore a limited understanding of their own teacher identity.

The above-mentioned perspectives point towards new research on how other research areas, concepts, and models can inspire new ways of working with graphic facilitation processes whereby distributions of the roles of participants are viewed as a significant part in which graphic facilitation is used to support reflection and learning processes.

Design sketching as a concept in graphic facilitation

Graphic facilitation is inspired by methods from architects and designers (Sibbet, 2001, 2008) who give shape by drawing, as seen in the practice of design sketching. Sketching is used both as an individual method (Goldschmidt, 2003; Schön, 1983) and as an applied method in design teams (Buxton, 2007; Olofsson and Sjölen, 2007). Olafsson and Sjölens (2007) delineate four purposes of sketching: *investigative*, *exploratory*, *explanatory,* or *persuasive.* From a graphic facilitation perspective, it would be interesting to study whether such purposes or modes could be implemented to the process as well as the consequences it would have for the process, the graphic product, and the participants.

As established earlier, the widespread practice in graphic facilitation is the use of icons and models to visualize processes (e.g., Group Graphic Keyboards and 7 elements). Thinking about deploying graphic facilitation in an exploratory mode opens for a discussion on whether specific icons and models are conducive to idea generation. Twerky and Suwa (2009) emphasize that both models and hand-drawn sketches are crucial in design development processes; however, sketches have greater potential than models in the preliminary idea generation phase because sketches: "*can represent incomplete objects as blobs, or incomplete connections as wavy lines, so that a designer can consider general configurations before committing to particular connections and specific shapes. Models demand completeness*" (p. 2). Similarly, Nørgaard (2012) points out that the overly strict application of framed icons in graphic facilitation reduces innovative thinking. Nørgaard utilizes what she calls *extreme sketching* together with SMEs (small and medium-sized enterprises), and through humor and provocative drawings, she challenges companies to rethink, e.g., their visions and business models.

From a learning perspective, it would be a valuable input to research the balance between scaffolding for participation in which icons do not have a constraining function (Nørgaard, 2017). Instead, in graphic facilitation, they can function as access to the edification of knowing in action (Schön, 1983), which can be helpful for participants who would otherwise be reluctant to draw as part of academic practice (Hautopp, 2017). Christoph Wulf (2017) emphasizes that when handling and using pictures and visuals in present-day society, it is important to stay in the iconic character of the image by memetic recreation of images. Wulf underlines that we learn through imitation and that this process enhances innovative thinking. While this is not only an imitation of pictures and images, it is a creative and productive action (Wulf, 2017).

These perspectives illustrate the need for further research on varying approaches to the function of icons in graphic facilitation and how they relates to learning, reflection, and creation in different modes and with different purposes.

A pragmatic approach and social learning perspectives in graphic facilitation

In order to explore the distribution of roles between the facilitator and the participants, it becomes necessary to look at which learning perspectives discuss facilitation and how facilitation is viewed. The above-mentioned sketching field is based on pragmatic approaches originating from, e.g., John Dewey (see, e.g., Goldschmidt, 2003; Schön, 1983; Twersky and Suwa, 2009) and from studies in which sketching, utilized as part of collaborative design events, gained currency. In these settings, participants do sketches as part of idea generation (see, e.g., Hansen and Dalsgaard, 2012; Mitchell and Nørgaard, 2011). These authors emphasize the productive role of material design artefacts in stimulating collaborative group reflection and dialogue (Hansen and Dalsgaard, 2012). Thus, there is a specific focus on participants' own production of drawings

and visual materials. Schön (1983) developed a conceptual framework on reflective practice, which focuses on practitioners' reflective processes when scrutinizing their own practice, e.g., *knowing in action*, *reflection in action, reflection on action*. Reflective practice can be seen as an important tool in practice-based learning where people learn from their own experiences rather than from formal learning or knowledge transfer. As such, it would be interesting to challenge the typical way of doing graphic facilitation whereby participants, for the most part, participate in oral dialogues and not in the actual visual productions.

For example, in PBL, students work in teams from an early identification of a problem space. Here, graphic facilitation can be used as a shared method in group processes. Aalborg University applies a PBL pedagogy, and in almost all semesters, there is a larger problem-oriented project work, on which the students (often in groups) are examined. Some identify teachers as facilitators in PBL (Donnely and Fitzmaurice, 2005: 12; Savery, 2006: 15), others as supervisors in project-based learning (Savin-Baden, 2003: 18). The majority of the learning processes are addressed in terms of their potential in rendering a high degree of practice–theory relation, addressing both reflection in and on action (see, e.g., Shepherd and Cosgrif, 1998). However, there are also challenges such as group dynamics and identifying and designing the problems at hand (Hansen and Jensen, 2004; Knudstrup, 2004). There are several suggestions in terms of integrating design processes into PBL focusing on a sketching phase (e.g., Knudstrup, 2004). Notably, the empirical evidence or efficiency of such approaches remains wanting, and the relevant questions are how graphic facilitation can be used in PBL and project work in education and whether teachers can facilitate a number of groups working on their own PBL projects.

Another feature of PBL is that students work in collaborative groups (see, e.g., Hmelo-Silver, 2004), where they identify what they need to learn in order to solve a problem, engage in self-directed learning, apply their new knowledge to the problem, and reflect on what they have learned. In order to support this self-directed learning process, graphic facilitation can be used as a tool for the students to externalize their ideas, which can spur further dialogue and group reflection.

Wenger (1998: 62) refers to Schön's conceptual framework when he emphasizes the relation between theory and practice as complex and interactive. Together with Lave, he takes a point of departure in an understanding of learning as a social phenomenon (Wenger and Lave, 1991), whereby learning happens through participation and is established through the participants' interrelations. The role of the teacher or facilitator is to scaffold a space and practice that encourage participation, but also where participation takes on various forms, some more active, some more observant, etc. (Wenger and Lave, 1991). In PBL activities, there is a need for the teacher to avoid the role of "expert" and, instead, take on the role of a coach or adviser in order to make space for students' independence (Donnelly and Fitzmaurice, 2005). For the teacher to avoid the role of "expert," we recommend the distribution of the *definition power* (see earlier example, Nielsen et al., 2016) to students by letting them draw processes and ideas themselves in order to explore the problem space for their projects. An investigation into whether presentations of typical icons (as an introduction to graphic facilitation) and the act of drawing can further students' academic practices needs to include research on icons and their affordances from a learning perspective. Which typical icons are conducive to students' processes and when do they play a constraining factor, e.g., according to Olofsson and Sjölen's (2007) four purposes of sketching: *investigative*, *exploratory*, *explanatory,* or *persuasive*?

Graphic facilitation and digital possibilities

As previously mentioned, the materials applied within graphic facilitation typically consist of a pen used on large wallpaper (e.g., Sibbet, 2001, 2008; Tyler et al., 2005; Valenza and Adkins, 2009), and several practitioners have emphasized the analogue line as the strength of the method (e.g., Madsen and Frank 2014; Nielsen et al., 2016; Valenza and Adkins, 2009). We therefore propose an exploration of the interface between analogue and digital possibilities when working with graphic facilitation.

Sibbet (2001, taken from Nielsen et al., 2016: 36) argues that new digital media such as digital cameras, digital drawing tablets, and drawing apps pave the way for new advancements in graphic facilitation. Meanwhile, at the summer 2018 international conference for visual practitioners, one of the workshops was called "Digital tools for the visual practitioners. From pain to possibilities," which focused on the transition from working on a large paper-based surface to a smaller digital surface (EuViz Conference, 2018). There appears to be potential and interest in combining graphic facilitation with digital visualization tools in practice, but research on the possibilities and barriers remain scarce (Nielsen et al., 2016). Looking at the related area of design sketching, we also see a growing interest in exploring visual-sketching techniques in relation to digital possibilities, e.g., animation-based sketching (Vistisen, 2016), designing with video (Ylirisku and Buur, 2007), and video sketching (Ørngreen, Henningsen, Gundersen & Hautopp, 2017). We therefore advocate for similar explorative approaches and formative interventions in relation to graphic facilitation.

Recently, various digital drawing tools have entered the market to support visual production, e.g., VideoScribe, which enable you to make your own Doodle videos utilizing prefabricated icons or your own hand drawings. In this case, the process is audio-visually recorded and documented, which results in digital videos. Furthermore, with the use of Livescribe Pencast, handmade drawings can be captured and digitally transmitted. Several of these tools connect analogue and digital drawings, but research on possibilities and barriers remain scare. Access to new technologies cannot themselves define new forms of practice. Digital tools do not in themselves change a practice; instead, they and constituted within practice (Stahl, Koschmann and Suthers, 2006). Moreover, the implementation of digital tools in the field of graphic facilitation demands empirically based interventions where these new constitutions can be examined.

In order to investigate digital possibilities and the barriers in the field of graphic facilitation, it is poignant to distinguish between *digitization* and *digitalization* (Manovich, 2001). Digitization involves reshaping analogue products into digital *products*, e.g., when a picture of the final wallpaper is taken and later distributed to participants attending the conference, meeting, etc. Digitalization has more to do with digitally reshaping the graphic facilitation *practice*, e.g., when the graphic facilitation is accomplished on digital drawing pads or tablets, e.g., distributed live on a big screen (e.g., Livescribe Pencast). This could potentially alter not only the process of facilitation by digitalization, but also the context of facilitation, as this process would, for example, allow for multi-site graphic facilitation, where participants are present at two or more locations, as in two different departments in an organization or at two campuses in a distributed educational setting. Graphic facilitation might also be used in online learning settings where participants are participating from their individual place: at work, at home, during travels, etc., still working collaboratively with the distributed visualizations. Another possibility is the use of other dedicated programs, such as VideoScribe, where prefabricated icons can be combined with one's own drawings in Doodle videos, which would alter the form—from graphic facilitation, resulting in still images, to graphic facilitation of videos, animations, etc.

These new modalities and processes resulting from digitization and digitalization need not only be examined rigorously, but also in relation to the questions of how they change graphic facilitation, the roles and responsibilities, and the competences needed to use graphic facilitation.

Conclusion – A suggested research design

The above sections identified graphic facilitation as an area with a significant number of experiences from practice, though with sparse research. In the review, we described the outset of graphic facilitation (history, processes used, icons, etc.) and provided insights into the roles, responsibilities, and dominant concepts of the graphic facilitator. Design sketching was presented as a related research area, which could lend inspiration to how graphic facilitation may be understood, investigated, and developed. The review demonstrated the need for empirical studies of participants, the forms of interaction and role distribution, as well as studies of digital possibilities in graphic facilitation aimed at supporting collaborative learning and reflection processes among employees and students.

In conclusion, there is a profound need to investigate graphic facilitation in a rigorously research-based manner. When systematic analysis is lacking, there is uncertainty around which types of techniques and processes support which types of reflections and learning processes—just as the casualties and dynamics in the relation between the participants and the graphic remain uninvestigated.

As future steps in qualifying empirical research, interventions can be designed and tried iteratively, with continuous theoretical reflection aimed at analyzing their applicability to practice. This would mean:

1. Various designs involving graphic facilitation and digital possibilities applied to practice and re-designed;
2. Observations and analyses of interactions between employees or students, the facilitator, and the (digital) materials;
3. Qualitative interviews or auto-ethnographic materials, where employees or students reflect on experiences with graphic facilitation interventions, conducted both immediately after and repeated after a given time (ranging from, e.g., three months to one year) to give a more solid long-term perspective on the effects of graphic facilitation.

Such approaches can provide a scientific backdrop of the changes or experiences implied in the method (if any) and the effects of using graphic facilitation in organizational and educational settings.

Competing Interests

The authors have no competing interests to declare.

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Paper 2: The Lazy Netflix B – an Ethnographic Study on the use of Humour and Visual Metaphors in teaching graphic facilitation

Paper 2: Hautopp, H. (2022). The Lazy Netflix B: An Ethnographic Study on the Use of Humour and Visual Metaphors in Teaching Graphic Facilitation (under review by *Journal of Designs for Learning*).

The second paper was central to the research project, as the paper provided knowledge about the context of basic graphic facilitation courses, posing the question: *How are teaching situations in basic graphic facilitation courses framed and reframed by teachers and participants*? Thus, this investigation was relevant to drawing connections between the organisational and higher educational contexts, where the course format can be characterized as a learning environment where employees or students can acquire skills within graphic and visual facilitation. Based on prior fieldwork and the pilot study from 2017 presented in section 1.4. "I want to draw – I cannot draw" – the dilemma in teaching graphic facilitation, the ethnographic study in the second paper was arranged with a focus on a more thorough investigation of the interplay between teacher, participants and visual display.

The second paper gave insights into significant aspects of teaching graphic facilitation to employees and outlined the teachers' didactical consideration regarding their framing and reframing of teaching situations. Furthermore, the ethnographic study of the paper served as an exploration of my own use of 'drawings as a means of doing visual research', where the empirical data was collected and produced iteratively alongside the analysis. In relation to the DBR approach of the research project, this ethnographic study provided significant knowledge regarding teaching situations with the aim of answering the research question: *How is graphic and visual facilitation being practised?*

* When this dissertation was submitted, Paper 2 was still under 2nd round of review, and therefore not made public available in the digitally version of the dissertation. On the next page is a preview of the first page of Paper 2. The copyright of this paper will be the property of the author and publisher when Paper 2 is published. For more information, contact the author.

Title: The Lazy Netflix B: An Ethnographic Study on the Use of Humour and Visual Metaphors in Teaching Graphic Facilitation

By Heidi Hautopp, Research Lab: IT and Learning Design, Aalborg University, Copenhagen

Abstract

Graphic facilitation revolves around using multimodal representations in order to drive idea generation, learning processes and collaboration among groups. The use of graphic facilitation is a growing practice in organisational contexts and is slowly emerging in educational contexts. However, there is a lack of research on the role of the facilitator when teaching graphic facilitation. At the beginning of basic graphic facilitation courses, facilitators are often met by enthusiastic participants who at the same time are hesitant and lack belief in their own drawing skills. Thus, the paper aims to provide insights into didactical considerations of facilitators when organising teaching that empowers participants to gain confidence in their own drawing abilities as an entry point to using graphic facilitation in their daily work. The empirical data used for analysis is based on participatory observations of two professional facilitators teaching two- to three-day basic courses in graphic facilitation. These observations are combined with follow-up interviews with the teachers. The analysis shows how visual metaphors and humoristic utterances are built up throughout the courses as social memories that are carried out and refined by participants. Thus, the study demonstrates how the use of humour and visual metaphors became multimodal 'hooks' of social memories, which support a playful and safe learning environment. The findings show how the teachers had a crucial role in initiating, acknowledging and supporting the use of humour in these settings. Based on the empirical findings, the paper concludes by outlining potentials and challenges specific to using humour and visual metaphors when teaching graphic facilitation.

Keywords: Graphic facilitation, multimodality, teaching, adult learning, humour and visual metaphors, spontaneous play

Introduction

> *'The adult target group can sometimes be afraid to draw. It can be restraining for them to stand up and draw something which others are supposed to see.'* (Teacher in graphic facilitation)

This quote captures what many teachers in graphic facilitation have experienced. Professional graphic facilitators note that comments from participants such as 'I can't draw' or 'I haven't drawn since elementary school' are common utterances at the beginning of a basic graphic facilitation course (e.g., Agerbeck, 2012). Despite participants' immediate anxiety about the act of drawing and drawing in front of others, there is a growing international practice of companies offering basic graphic facilitation courses to employees interested in acquiring skills that would make them more capable of using visual icons and processes when facilitating meetings, conferences, teaching, etc. in their daily work.

The scope of this study addresses how the anxiety of the participants in these courses is tackled by teachers in order to create a positive and safe learning environment. The study is based on observations of two professional facilitators teaching basic two- to three-day courses in graphic facilitation. These observations are combined with follow-up interviews with the professional facilitators discussing different didactical considerations and focusing on the involvement of participants and their own role as

PREVIEW

Paper 3: From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees

Paper 3: Hautopp, H., & Ørngreen, R. (2022). From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees (submitted for review by *Journal of Visual Communication*).

The third paper presents long-term perspectives on the impact, effect and value of using graphic facilitation in organisational contexts. Drawing on both a literature review and an empirical study, we aimed to investigate an underexplored long-term perspective in the field of graphic facilitation as outlined in Paper 1. Furthermore, this paper provided valuable insights into the participants' experiences of acquiring and applying drawing skills in their daily work contexts, which provided significant knowledge regarding the research question: *How is graphic and visual facilitation being practised?* The results of this study also laid a foundation for points to pay attention to, when drawing connections between participants' experiences in organisational contexts to participants' experiences in higher educational contexts.

Building on experiences from the study in Paper 2, I further explored drawing as an elicitation method, encouraging participants to bring drawings to the two follow-up interviews to ground their experiences in concrete examples from their daily work.

* When this dissertation was submitted, Paper 3 was still under review, and therefore not made public available in the digitally version of the dissertation. On the next page is a preview of the first page of Paper 3. The copyright of this paper will be the property of the author and publisher when Paper 3 is published. For more information, contact the author.

Title: From training to practice: Long-term perspectives and effects of teaching graphic and visual facilitation to employees

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Abstract:

Graphic and visual facilitation is a growing international practice and is often used to describe what professionals do when visually facilitating group processes. Although the professional arena has grown, and facilitators have published several practitioner guides, there is a lack of empirical research in the field, especially regarding long-term perspectives on teaching and doing graphic facilitation in organizations. This paper aims at investigating employees' experiences and competence development over time within the visual methods. Thus, the study followed three employees from their participation in a 2-day basic graphic facilitation course, and in two follow-up interviews, eight months and two years after completing the course. The empirical data were analysed based on a literature review conducted on long-term perspectives, focusing on three themes: 1. The graphic facilitation practice at individual, group and organizational level; 2. The influence contextual knowledge and knowing about the participants has and 3. The relation between objects, processes and competencies needed. The findings show that all three employees continue to use graphic and visual facilitation, and found it valuable for giving new insights and overviews of work processes and tasks. Graphic facilitation was used to create common ground and goals. The trainees utilize their contextual knowledge about the organization to aid the process, and found that being sensitive to various groups' needs and personal preferences can be effective in the long run. These themes and perspectives on approaches to graphic and visual facilitation are further discussed and a future focus on the facilitation format and participants' experiences is suggested.

Keywords:

Graphic Facilitation, Visual Facilitation, Long-term perspectives, Organizational practices, Group Processes, Empirical Study

1. Introduction

Graphic facilitation is often used to describe what professionals do when visually representing group processes (Sibbet, 2008; Tyler et al., 2005). The method was initially inspired by the ways in which designers and architects utilize visualizations and sketching when working with clients (Sibbet, 2001). Some practitioners describe graphic facilitation as analogue drawing techniques, where the facilitator draws on large pieces of wallpaper while involving participants (Tyler et al., 2005), and argue that graphic facilitation is not about depicting reality; rather it is about representing ideas and icons in real-time that reflect the participants' contributions (Valenza and Adkins, 2009). One of the founders of graphic facilitation, David Sibbet, emphasises how simple drawing techniques, e.g., Group Graphic Keyboard (Sibbet, 2008) can become "*power tools for effective meetings*" (Sibbet, 2010; introduction, xii). Similarly, the

PREVIEW

Paper 4: Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study

Paper 4: Hautopp, H., & Ejsing-Duun, S. (2020). Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory Case Study. *Electronic Journal of E-Learning*, *18*(5), 373-386. https://doi.org/10.34190/JEL.18.5.001 (published)

The fourth paper presents one of the three design experiments conducted with a primary focus on exploring the last part of the research question: *How can graphic and visual facilitation support design exploration in higher education?* In this paper, we explored the use of visual facilitation in teaching situations with art students, who constitute a target group that supposedly are familiar with using visual methods as part of their academic practice. From a DBR perspective, this enabled my research to go into a more invention-based mode where I could actively explore the connections between pragmatic inquiry approaches, and design sketching, and the visual materials produced and shared between the students. Moreover, this paper explored the active roles of the students as game designers and the educators as designers of teaching, which laid the foundation for a more explicit development of these roles in the next two design experiments.

The fourth paper was also a stepping stone for exploring the digital possibilities within visual facilitation as the context was online teaching across campuses in Nordic Countries: Denmark, Sweden and Finland.

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Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education

An Exploratory case study

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Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study

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Abstract: This study investigates how the use of visual facilitation and representations, e.g. visualisations and video productions, combined with peer-feedback sessions can create exploratory approaches to game design in online teaching. The article analyses an iterative game development process in an online learning context. The empirical data is primarily based on an explorative case study of "Games for change"; a course held in 2018 in which master students from the international Nordic Visual Studies and Art Education (NoVA) design games that address issues in society. Throughout the course, the students from universities in Finland, Sweden and Denmark engaged in a cross-cultural collaboration across campuses. The purpose of the study was to explore how to establish an online space for joint design inquiry in the context of 'games for change' across time and space as well as cultural and professional barriers. The data used for analysis includes teaching observations, videos of play sessions, photos and visual representations, students' reflection papers and students' written and oral evaluations after completion of the course. The analysis is based on different problem-based learning (PBL) activities; lectures, video instructions, presentation- and feedback sessions, reflexive exercises and students' self-directed design and learning processes in groups. As part of the game course, teachers presented game theory and exercises through videos and visualisations to support the students' iterative game design processes. The analysis of the PBL activities shows that teachers' video instructions relating theoretical game concepts to the students' actual group work supported the introduction to the game field as well as their design processes. The balance between the value of video instructions with specific feedback and teachers' time for preparation is a relevant issue for further exploration in online teaching. Moreover, findings show that the students' visualisations and video productions exemplifying game situations created a visible reference point for further discussions in feedback sessions across campuses, which guided game development. Thus, the combination of inquiry approaches, critical game theory and design processes combined with students' visualisations and video productions provides interesting connections for bridging gaps between cultures and professions, e.g. in art and games. By the rich and visual descriptions of PBL activities, student work and reflective evaluations, the exploratory case study can function as inspiration for applying similar approaches to new local contexts in higher education.

Keywords: visual facilitation, visualisations, online learning, students as designers, design as inquiry, higher education

1. Introduction

This paper revolves around an exploratory case study on the use of visual facilitation and visual representations, e.g. visualisations and video productions, in online game-based learning at universities, specifically for the master program Nordic Visual Studies and Art Education (NoVA). The purpose of the study was to explore how to establish an online space for joint design inquiry in the context of 'games for change' across time and space as well as cultural and professional barriers. In a previous research and development project, we have explored the students' design and learning experiences when adopting a pragmatic inquiry approach (Dewey, 1938) in the process of developing communication designs (Ejsing-Duun and Skovbjerg, 2018). During these iterative processes, the students had the role of designers working with different sketching techniques and prototypes (see e.g. Schön, 1983; Twersky and Suwa, 2009). In this way, an essential part of teaching was for students to materialise their ideas and understandings of a wicked problem and the domain of teaching as well as to obtain feedback from peers and teachers when presenting their materialised ideas (Ejsing-Duun and Skovbjerg, 2018).

Like the former study, in this exploratory case study, students were prompted to adopt a pragmatic inquiry approach in their design processes. The students had an end goal of developing *games for change*, which invites players to relate to a wicked problem and gives players opportunities, awareness and interesting choices in relation to the problem. Unlike our prior research project, the teaching setting for this case study was online, which demanded new ways to create shared spaces for lectures, peer-to-peer presentations, and feedback sessions.

In his book *Teaching in a Digital Age*, Bates (2017, p.260) emphasises new digital opportunities, which he refers to as 'rich media', media which "differ in terms of their formats, symbols systems, and cultural values". Bates

Reference this paper: Hautopp, H., and Ejsing-Duun, S., 2020. Spaces of Joint Inquiry Through Visual Facilitation and Representations in Higher Education: An Exploratory case study. *The Electronic Journal of e-Learning,* 18(5), pp. 373-386, available online at www.ejel.org

claims that online teaching can incorporate a range of different media: text, graphics, audio, video, animation and simulations. According to Bates, the use of different media allows for individualisation and personalisation in learning, suiting learners with different learning styles and needs. Other studies show that teachers' production of videos and video instructions in online settings affect students' engagement and enable a flexible teaching style suiting learners with different needs (e.g. Wells, Barry and Spence, 2012; Guo, Kim and Rubin, 2014). Furthermore, video produced in an informal setting and with the teacher's talking head as a part of the video are more engaging than slides alone or high-fidelity studio recordings (Guo, Kim and Rubin, 2014). This exploratory case study explored both the teachers' and students' use of visualisations and video productions in an online game-based teaching setting and examined their value in these iterative design processes.

The new ways of creating shared online spaces had a focus on combining inquiry practices with visual practices. As an overall perspective, the concept of *visual facilitation* (Qvist-Sørensen and Baatrup, 2020) was applied to describe and discuss how teachers and students are constantly framing (Goffmann, 1986) the joint online inquiry space through visual representations. Western culture has consistently privileged the spoken and written word as the highest form of intellectual practice and seen visual representations as second-rate illustrations of ideas (Mirzoeff, 2002). In continuation of this perspective, studies argue that for too long, written text has been privileged as a communication form in education, over e.g. visual, kinesthetic and haptic modalities (Bowen and Evans, 2015). By combining inquiry- and visual approaches in this exploratory study, we also want to challenge traditional assumptions about academic practices in higher education.

2. Method and case description

The empirical data is primarily based on a 12-week online game-based learning course as part of Nordic Visual Studies and Art Education (hereafter NoVA). NoVA is a two-year master programme, which educates students in contemporary art and visual culture to achieve an understanding of Nordic practices and traditions in art education and visual communication. The aim is to provide students with relevant competencies and didactical interaction skills to work in cross-cultural and international educational environments. Three Nordic universities provide teaching including Aalto University in Helsinki, Konstfack, in Stockholm, and Aalborg University in Copenhagen. During the master programme, each NoVA student enrols in the educational programme at two of these universities. The authors of this paper are teachers of the course analysed. Both are employed at Aalborg University, Copenhagen.

Due to the geographical distance, the NoVA master programme is based on a combination of e-learning, face-to-face meetings and a cross-campus symposium each semester. Thus, the concept of blended learning is the foundation of NoVA. Furthermore, the NoVA master programme relies on problem-based learning (PBL) approaches for students to develop 'criticality', meaning emotional, intellectual and practical independence (Savin-Baden, 2003). Moreover, for PBL, the teachers function as facilitators who organise a learning environment, which involves different activities, e.g. instructions, students' self-directed learning, presentations and feedback sessions (Newman, 2005; Bates, 2017). As part of the NoVA master programme, the use of multimodal approaches, including text, images, audio, and videos are central elements to teaching.

This was the context for developing the online game-based learning course (hereafter 'game course') as a part of the NoVA master programme in autumn 2018. The focus of the game course was for the students to use games and game elements to make a change. Prior to the online course in 2018, the course was provided in 2016. During the 2016 course, potentials were observed in the students' productions of visualisations as part of their game design and learning processes. One example was a student from 2016 who elaborated on how she and group members used visualisations and cartoon-like drawings when developing and presenting design ideas online across campuses: "*These visuals travelled through to the project I did make when gamifying an experience* (…) *we ended up by using visuals as prompters, e.g. collage and cartoon characters."* The student explained how during collaboration, they discussed the potential of using visuals to engage participants in playful game activities. At the same time, she found it beneficial to use visual notetaking in her own learning and reflection processes: "*It made the design processes much more tangible for me when I was then applying the theory to the project that we were working on together."* These examples show that the student and her group reflected on their use of visual productions, which indicates great potential. Thus, in the second iteration of the course, we included additional guidance and framing of students' visual productions to explore the potential of these methods in joint online inquiry processes.

As students were asked to adopt the role of game designers, we also consider our role as educators to be designers of teaching (Sørensen and Levinsen, 2018; Ejsing-Duun and Skovbjerg, 2018) when doing educational research. Therefore, the courses from 2016 and 2018 are two iterations in which the teaching has been re-designed based on experiences, and results from this exploratory study will function as inspiration for a new re-design of the course. As mentioned, experiences with the potential of visual productions from 2016 were given even more priority in our didactical considerations for the iteration of the game course in 2018.

Fifteen students attended the game course in 2018, and the data used for analysis included teaching observations, videos of play sessions, students' reflection papers and written and oral evaluations with participants after completion of the course in 2018. Due to the limited data foundation, the purpose of this paper is not to make generalisations about the use of visualisations and video productions in online game-based teaching but to investigate strategies for using visualisations and video productions by both students and teachers to establish a joint online design inquiry. Thus, learning potential and barriers in these online teaching settings were explored.

3. Theoretical perspectives

In this section, the design of the game course is concretised and related to online learning at PBL universities as a theoretical foundation to this approach in education. Furthermore, the pedagogical considerations of staging students as game designers, who materialise their inquiry processes through visualisations and video productions, is discussed. This theoretical section concludes with the notion of visual facilitation and framing, which is relevant when describing how the creative online learning environment is framed by both teachers and students.

3.1 Course content: Critical game design

In order to provide insight into what the students were taught, this section presents the course content. The purpose of the game course was for students to investigate the game phenomenon in relation to their background in art and to explore how game elements can spur change by engaging players in certain issues. As mentioned, the objective of PBL is for students to develop 'criticality' (Savin-Baden, 2003). This was also a purpose of the game course, and therefore it included critical play design (Flanagan, 2013) as a main theme. As Flanagan (2013, p.6) emphasises, 'Critical play means to create or occupy play environments and activities that represent one or more questions about aspects of human life'. Through this lens, students were encouraged to consider game scenarios that could foster questioning and dialogues about issues normally taken for granted (Flanagan, 2013). In line with the concept that to nurture PBL, teaching must be ill-structured, open and real-world orientated (Savery, 2006), we introduced the course by openly asking: '*Games for change!? Let's explore the possibilities of using games and play for change!*'

The course was designed as an iterative design process and joint reflection guided by five different themes: Critical Play - games and activism; Game mechanics; Framing; Place and space; and Participation. In addition to critical play, the game course also introduced 'game mechanics' through the notion of the *endogenous meaning* of games, where interactive structures in games require players to struggle towards a goal (Costikyan, 2002). Accordingly, students should reflect upon the endogenous meaning of games they played in relation to game mechanics. Game mechanics include rules, goals, challenges, struggles, possibilities of interactions and collaborations between players (Costikyan, 2002). Framing was introduced through 'performing disbelief' (McGonigal, 2003) and 'ambiguity' (Gaver, Beaver and Benford, 2003). Theory about place and space included location-based games (Ejsing-Duun, 2011) and 'games for urban exploration' (Pinder, 2005). Participation included how to engage players in games (Jensen and Lenskjold, 2004). Through these five themes, we aimed to set students as reflective game designers using visualisations and video productions as part of iterative game design processes.

3.2 Educational design - visualisations and video productions as inquiry approaches

NoVA students typically have a background in art, design and communication before they join the master programme. Thus, many of the students are familiar with visualisations as part of their work practices; however, the students are in general unfamiliar with theoretical and methodological frameworks for games. Educational studies show that applying visualisation tools and techniques supports design students with an entrance to theoretical fields because it constitutes a familiar way for students to explore and to make sense of situations (see e.g. Bang, Friis and Gelting, 2015). Additionally, a study showed that visualisations support the

communication of design ideas and collaboration (Twersky and Suwa, 2009). Drawings, pictures and other symbolic tools are important elements of the human repertoire for meaning-making, which also form a joint memory relevant for specific practices (Ivarsson, Linderoth and Säljö, 2009). Pink (2007) explains that researchers can use photographs to document experiences and as concrete reference points in dialogues of experiences afterwards. Thus, we consider the use of visualisations and photos are familiar symbolic tools for students to use when entering the game field as well as when investigating and presenting their design ideas.
As mentioned in the introduction, the point of departure for the game course was for the students to adopt a pragmatic approach (Ejsing-Duun and Skovbjerg, 2018) when exploring games for change through design. This approach is based on John Dewey's (1938) concept of *inquiry*. Dewey proposes that 'doing' is central to understanding how we think and learn by reflecting on our practices (Dewey, 1938). Donald Schön (1983) brings Dewey's thinking into professional practice by creating language that makes it possible for designers to make their knowledge of their own practice visible. By using visualisations, students can externalise tentative and imprecise ideas in *sketches* (Twerky and Suwa, 2009), leading to a *conversation with materials* and with peers (Schön, 1983) and thus to refinements in their designs.

Facilitators of education (Newman, 2005) are obligated to create a learning environment for inquiry processes and dialogues. Other educational research has focused on organising learning environments that place the *students as learning designers*, where the teachers scaffold students' subject-related inquiry, agency, reflection and learning (Sørensen and Levinsen, 2018). In the game course, the students were encouraged to adopt the role of learning designers when designing games with a specific purpose and target group. To scaffold the students' subject-related inquiry (Sørensen and Levinsen, 2018), we organised exercises where students first adopt the role of gamers, experiencing different digital games and location-based games. Second, the students were encouraged to adopt the role of game designers using their own personal game experiences in the collaborative process of developing a game. This approach was inspired by auto-ethnography, where personal experiences are used to understand different cultural phenomena (Ellis, Adams and Borchner, 2011), in this case games.

The game course was taught online. In this context, we explored how students' video productions can expand the time frame of the students design ideas in addition to their more static visualisations and photos. Specifically, in the students' final iteration of their game design exemplifying the game experiences and narrative of the game, still receiving feedback on their design ideas. Based on prior studies, we advocate for video-sketching techniques (Ørngreen, Henningsen, Gundersen and Hautopp, 2017) where the tentative and unfinished 'sketchy' feeling of the materials (Twersky & Suwa, 2009) is still in focus. Thus, the learning *process* of making video productions is central to developing a game design with less focus on making aesthetic video productions (Ørngreen, et al., 2017). As the focus was students using different media in their inquiry processes, there was also an increasing focus on teachers using visuals and videos when designing online teaching (McKeachie and Svinicki, 2006; Bates, 2017). In order to 'walk the talk', we also engaged in an iterative process exploring the use of visualisations and video productions as a central part of online teaching with an iterative focus on process over product (Guo, Kim and Rubin, 2014; Ørngreen et al, 2017).

3.3 Visual facilitation: framing and creating the online inquiry space

Throughout this paper, the ways visualisations and video productions were applied by both teachers and students to create a joint online space for game design inquiry, are presented and discussed. To describe these applications, the notion of *visual facilitation* is introduced as a way to discuss the dynamic *framing* of the learning environment.

Visual facilitation stems from the concept of graphic facilitation (Hautopp, 2018; Qvist-Sørensen and Baastrup, 2020) which was formulated in the 1970s by a group of organisational consultants in California who used visual techniques and tools in groups to find solutions to complex issues (Sibbet, 2019; Qvist-Sørensen and Baastrup, 2020). Initially, the method was inspired by the way designers and architects utilise visualisations and sketching with clients (Sibbet, 2001; 2008). Visual facilitation is a growing practice internationally (e.g. Blijsie, Hamons and Smith, 2019; Sibbet and Wendling, 2019; Qvist-Sørensen and Baastrup, 2020). In 2019, stories were gathered from 50 leading visual facilitators around the world in the book *The World of Visual Facilitation* (Blijsie, Hamons and Smith, 2019). They are richly cross-disciplinary and practice-based stories but there is limited empirical research in the field, especially related to formal educational settings (Hautopp and Ørngreen, 2018).

Visual facilitation that "uses visual representations to facilitate interaction in a group of people using structured visual content" (Qvist-Sørensen and Baastrup, 2020, p.20) was included to facilitate the joint online space for game design inquiry. Thus, our purpose was to apply visual facilitation to a formal educational setting: the NoVA game course.

Blijsie, Hamons and Smith (2019) emphasise three main strategies of visual facilitation: 1) Draw live, 2) Use templates and 3) Get a marker in people's hands. In this case study, the focus was not on drawing live as part of the game course as much of the activity was asynchrony. Instead, we created visual templates for the students to act upon, and we encouraged them to draw and to produce visual materials to capture, develop and present their design processes and game design throughout the course. This is in line with the pragmatic approach of the students testing ideas and reflecting upon their practices (Ejsing-Duun and Skovbjerg, 2018). Thus, we argue that the use of visual facilitation strategies can make design processes more explicit and can prompt reflection on the domain of inquiry: here, games as agents for change.

Visual facilitation is originally facilitation with the structured use of pen and paper (Sibbet, 2001; Qvist-Sørensen and Baastrup, 2020), but technology is mentioned as providing "new means to draw, adjust and share our drawings with one another" (Qvist-Sørensen and Baastrup, 2020, p.17). As the NoVA students were widely distributed but needed to share visual products with their peers, digital tools that support visual facilitation in groups were used (Pohl, 2019). Other facilitators suggest that the involvement of participants in drawing and creating videos as part of their online learning processes is crucial (e.g. Lenzo, 2019). Digital tools also enable quick processing and online sharing of visual results (Pohl, 2019), supporting the iterative approach to the game course.

As the concept of visual facilitation in this online learning environment is introduced, different types of analogue and digital visual representations; sketching and visualisations in group work; drawings, video instructions, video recordings of game experiences and video presentations of game design is explored. Thus, the concept of visual facilitation is applied in a formal online setting of higher education where students *draw, adjust* and *share* their game design ideas as part of the game course.

As an analytical strategy of the joint inquiry space, the notion of framing should be introduced. According to Goffman (1986), framing is a dynamic and interactional concept for describing participants' activities of defining what is occurring in a specific situation. In line with this perspective, social practices are not predefined or given but are something that participants create and recreate through interactions (Lantz-Andersson, 2009). Applying the concept of framing in the analysis, PBL activities in the game course are viewed as social practices where both teachers and students dynamically create and recreate the online learning environment.

A critical element of how we frame in situations is dependent on earlier experiences and how we relate these experiences to the activity at hand (Goffmann, 1986). Thus, the teachers' constitution of a given course activity is fundamental for what is possible to learn. Framing includes the disposal of resources and tools for the students to engage in (Lantz-Andersson, 2009). Thus, visualisation methods and techniques were introduced to explore how they framed the students' participation and relation to the content matter. According to Goffmann (1986), it is essential to study activities from participants' perspectives to understand how they *frame* situations. Thus, the emphasis in the analysis of the empirical data was students' reflective utterances and evaluations.

4. Analysis of the game course

The analysis is an introspective review of the joint inquiry processes that unfolded during the game course. Based on the initial introduction of the game course, the students were presented to the main task of developing a *game for change* that they should design through iterative activities during the 12-week course. During the 12-week course, five different game theoretical themes were discussed in synchronic online meetings to support the students' asynchronous group work. As mentioned, the course was initially framed by openly asking: '*Games for change!? Let's explore the possibilities of using games and play for change!'* The expected learning outcome was for the students to develop a game informed by game theory and refined through game test and peer feedback. After the initial phase, the students were grouped into two-four persons based on common interests, and they began developing their games. Throughout the game course, five groups developed different game designs related to the overall topic of *games for change*.

As teachers and facilitators of the online learning environment (Newman, 2005; Qvist-Sørensen and Baastrup, 2020), the teaching of different activities was structured as follows:

- Online meetings: lectures, video instructions, presentations and feedback sessions
- Reflexive exercises
- Students' self-directed design processes and learning in groups

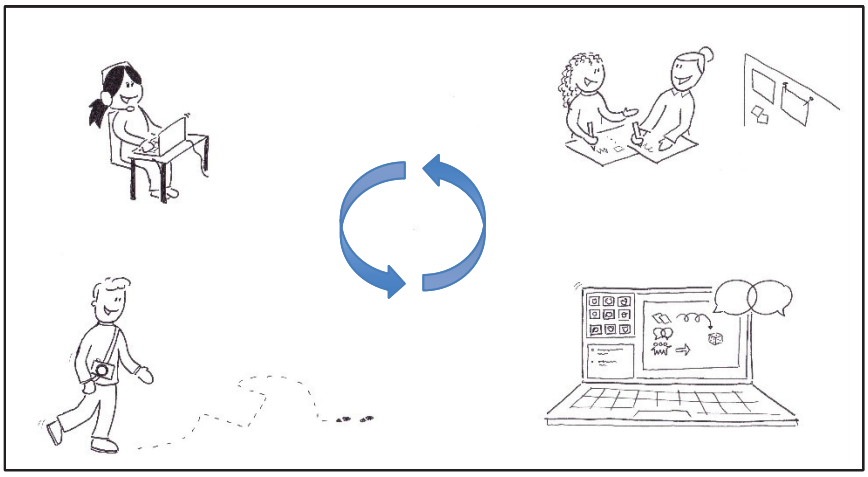

Figure 1: Presentation of the different PBL activities; reflexive exercises, students' group learning and online meetings, etc. (Hautopp, 2019)

The following analysis is organised in relation to the different PBL activities in the course, and the relation between the activities is emphasised. For each activity, examples of students' and teachers' strategies when using visualisations and video productions during the course are discussed.

As we work iteratively with researching educational design, the inquiry process involves producing demonstrable design and changes at the local level and reflecting on the use in other contexts (Barab & Squire, 2004). Thus, the research approach is justified by the way the educational design work in practice by providing a rich description of context, theory and interventions. In the analysis, we aim to give a rich and visual description of empirical examples discussed in relation the educational design and theories.

4.1 Online meetings: lectures, video introductions, presentations and feedback sessions

The course was organised with joint online meetings using the video conference system Adobe Connect. Each meeting focused on a specific theme: *1) Critical Play - games and activism, 2) Understanding games, 3) Framing, 4) Games in place and space* and *5) Making an invitation - participation.* Initially, online meetings were planned to last for two hours with 20-30 minute lectures of relevant concepts from the specific theme followed by feedback sessions between the students. In parallel with the development of the students' games, we wanted to make space for more joint inquiry and dialogue in the feedback sessions. Thus, the online meetings were redesigned with more time and focus on feedback sessions in smaller groups, placing the lectures in video introductions for students to view between online meetings. According to McKeachie and Svinicki (2006, p.58), lecturing is best used for summarising and adapting material to the interests of a particular group, initially helping students discover key concepts, principles and ideas within a specific topic. In our case, video introductions were used to relate the themes and theoretical game concepts of the week to the students' work designing games. Concrete examples were included for the students to act upon (Dewey, 1938). Thus, the videos were developed between weekly meetings, adapting to the latest online dialogues and feedback sessions and relating new concepts to the designs and discussions with examples tailored to the students' projects. Simple video recording techniques and tools, e.g. screen recordings (Camtasia and Screencast-o-matic) with a teacher's talking head (Guo, Kim and Rubin, 2014) (see figure 2) or PowerPoint recordings in one-take, were used to retain the tentative and imprecise 'sketchy' feeling in the videos (Ørngreen et al., 2017).

Figure 2: Video instructions with a teacher's talking head in a screen recording with specific feedback on students' game design ideas. The teacher is sitting on a couch and is quite informal

Figure 2 illustrates a video tutorial about the theme 4) *Making an invitation – participation.* The teacher related the topic by asking the groups '*How are you going to invite people to play your game?*', specifically relating the question to each of the five groups and their previous game design ideas. The advantage of this approach to video instructions is that the students generally had experiences with the videos as relevant and meaningful in relation to their design work. In their written evaluations, all students expressed appreciation of the video introductions. This is evident in this student's comment: "*I really appreciate that there were videos in advance to see and prepare for an upcoming online lesson. It helped much to concentrate on a specific topic* (…), *and your feedback about our game design processes was also very helpful. I think these preparation videos with examples (!!) are great."* Thus, for this student, the video provided a focal point, which helped in preparing for the next session. This is supported by another student's comment: *"The videos were so helpful! It was great to be able to go into the reading knowing a bit about what the context was rather than grappling to understand it. I appreciated the main points and concepts as well, as I was able to get more from the readings with the videos."* In this way, the students used the video introductions to frame the readings and design processes as the feedback provides focus and premises for reading and for the design process.

The disadvantage of this approach to making videos is that it can be time-consuming to produce and render the videos. Moreover, the video introductions cannot be reused for the next semester because specific student projects are mentioned in the videos. In the oral evaluation after the course, some students proposed that the videos should be 5-10 minutes instead of 20 minutes, which could be less time-consuming for teachers.

As a central part of the online meetings, students were asked to give a 5-7 minute visual presentation of their current state of game design. Each stage related to the specific game theme of the week; however, online participation requires technical competences. A student elaborated on the experiences of the online feedback sessions*: "Of course, this was also not the first online course, so that made a big difference for me having learned and understood the platform and technologies.*" Thus, an understanding of the different functions of the online platform, e.g. how to share and comment on the visual representation of design ideas, is essential. Other students also appreciated the feedback sessions as highly relevant to their design processes but mentioned online experiences as a factor in the process: *"Giving online presentations and being opponents all in all is good for the design processes and in this course it worked perfectly. Personally, it was a bit hard due to a lack of experience in this kind of online learning environment."* These findings point to learning potential for the students in the feedback sessions both in the role of presenter and opponent, and at the same time, it is central to have experience with these activities for students to feel comfortable in online learning environments.

Several students mentioned the benefits of feedback for their design processes: "*Giving presentations was essential! That way one had to formulate thoughts into a brief space of slides and then somehow share what one was passionate about."* Another group acted as opponents to the presentation, giving feedback on the game design using the theories presented for the week. In this way, the students used visualisations to frame the understanding of their game design in relation to specific topics and theoretical perspectives. A student commented on the role of an opponent: *"I value peer review. It's good to learn how to communicate both compliments and critical points."* We argue that the use of digital tools for quick processing and the elaboration of visual results in a PowerPoint presentation (Pohl, 2019) made the students' game designs explicit and applicable for joint inquiry in the feedback sessions.

4.2 Reflexive exercises

To encourage students to activate relevant prior knowledge of games and art (Goffmann, 1986; Newmann, 2005) as well as to engage them in new game experiences, we structured reflexive exercises between the online meetings for students to act as gamers as well as game designers (Levinsen and Sørensen, 2018). The reflexive exercises targeted the different themes of the online meetings and required the students to take an auto-ethnographic approach with a focus on the personal experience of playing the game (Ellis, Bochner and Adams, 2011). Examples of activities are: 1) Present game experiences and post questions for debate in an online forum; 2) Make a video screen recording playing a self-chosen game in relation to game mechanics and definition of games; and 3) Make a dot.walk in relation to the theme *Games in place and space* as an example of a location-based game. As part of the reflexive exercises, the students were asked to write a two-page reflection paper for each online meeting reflecting both the exercise, the game theory and the group work on developing games. The individual exercises were a supplement to the students' group work, and the purpose was for the students to embed the game concepts in relation to different activities. Through these exercises, they strengthened their entrance into the game field.

One reflexive exercise was a dot.walk (Medienkunstnetz, n.d.) for which the purpose is to be guided in a city by simple codes and instructions (turn left 1st street, turn right second street, turn left third street). The walk was set to take 10 minutes, and the students were asked to document their walk by taking five photos to reflect on their experiences and to subsequently adjust the instructions for the game to redesign it. This was reported in a two-page reflection paper. The purpose of the dot.walk was for the students to try a location-based game (Ejsing-Duun, 2011) and to experience how simple rules can produce new actions and playful activities in a well-known area. In this exercise, the game structure is framing a behaviour, and the instructions framed the students' meta-reflections on the framing. The act of taking photos is a framing in itself because the student taking the photo focuses on what is within the frame of the photo, leaving something out.

A central part of PBL is facilitating self-directed learning (Newman, 2005); however, this can be difficult when students are situated across campuses. In the first course in 2016, the presentations of the dot.walk were not specifically framed, making it difficult for students to use their experiences for discussions and as materials for design. To improve this, we made a visual template of a dot.walk created as a PowerPoint recording using sketchy drawings, photos and a voice-over reflecting on their own walk experiences to instruct and to inspire students (see figure 3).

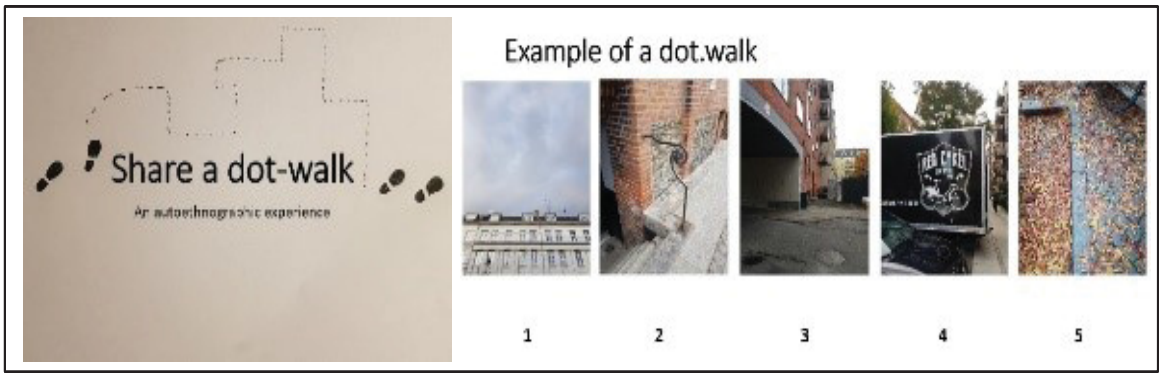

Figure 3: Examples from the teachers' visual template of a dot.walk

This template was intended to frame the exercise so that students could perform it on their own and share it within their groups and during the online meeting. In this exercise, the visualisations provided students with a tangible memory of their walk and made it possible for the group to facilitate a discussion about their experiences.

In addition to taking photos during the dot.walk, some students decided to draw a map of their walks or visualised the route in a Google map (see figure 4). Thus, students used different visual representations to facilitate an understanding of their walks for fellow students and teachers.

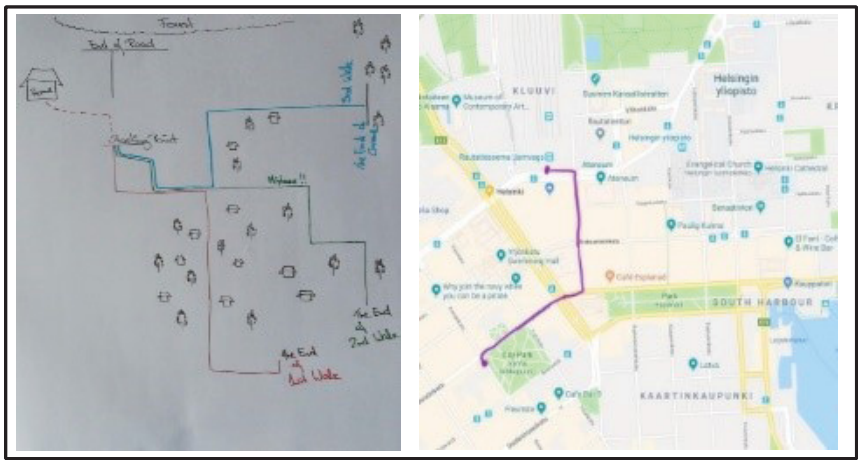

Figure 4: Students' drawings of walks and visualisations of a route in Google maps

The student drawing the map of her walks meta-reflected upon the importance of the 'framing of games' when she almost went to dead-end road in her second dot.walk: "*This experience only emphasises the importance of game design and why the framing of the game is a significant part. As for players, this experience emphasises the importance of following the rules if we want to engage with the game*". From a pragmatic perspective, this student theoretically reflected upon her own game experiences with location-based game by noting how framing and rules are significant for players' engagement.

In his first dot.walk, another student stumbled upon a rear-view mirror on the roadside (see figure 5a). He described the normal use of these types of mirrors as well as how they could function as a creative and playful way to challenge the game experience: "*This mirror is used for cars to see whether there is traffic but it is a nice feature which can alter or show you another dimension of where you are about to walk.".*

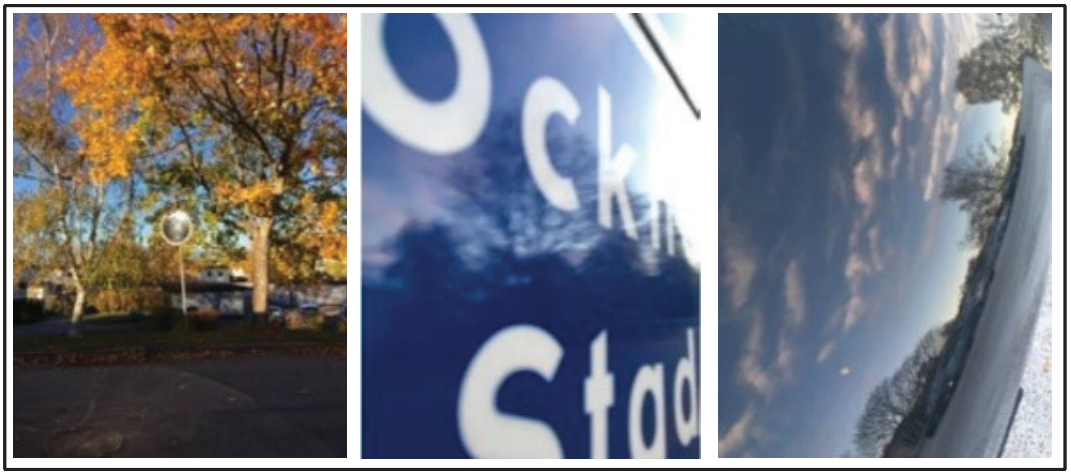

Figure 5: Photos from a student's dot.walk: a photo of a rear-view mirror on the roadside (5a) and two photos of 'reflecting things' (5b-c)

On the second dot.walk, he adjusted the codes and instructions inspired by his previous experience: "*New code: Only take photographs in reflecting things. That way, you can create the feeling of another dimension*." (see figure 5b-c). After the second walk, the student reflected upon this way of framing photos focusing on reflecting objects: "*The new code made it much more playful to observe the area. It was also a challenge finding the reflecting objects everywhere, and it brought out the fact that more things than I expected do have a reflection of landscape! "* In this meta-reflection, the student argued based on own experiences that *"making a code or guidelines is good, altering the ordinary is even more important. So, the twist is what makes the walk exciting".* In addition to the two-page reflection paper, the students also shared their dot.walk experiences scaffolded by the teachers during the next online meeting. Among others, it was discussed that 'altering the ordinary' is a crucial game mechanic when framing critical design (Flanagan, 2013) in games for change.

In these self-directed reflexive exercises, students used visualisations to engage with the topics presented, and a dialogue with their own experiences invited their peers into the dialogue. As such, the visualisations enabled and framed academic discussions and inquiry across space and time.

4.3 Students self-directed design processes and learning in groups

In retrospect, the individual reflection exercises also functioned as shared inquiry spaces for the students to combine their interests in art and photographs to design games. Thus, the exercises also lay a foundation for the students' self-directed learning in groups. For example, a walk in the subway in Stockholm taking photos was used as an inspiration for a *game for change* with a focus on women's periods. In the subway, the students took photographs of graphic artist Liv Strömquist's enlarged visualisations of women having their periods, some of them entitled: "*I'm alright (I'm only bleeding).*" This exhibition has created public debate (Hunt, 2017) and in their presentations, the students used their pictures to make a critical stand in line with the artist regarding taboos related to women's periods. It can be argued that the students used this inspirational walk in the subway to foster ideas of how to question normative assumptions of women's periods through a critical game design (Flanagan, 2013). During their game development, the students made their own visualisations inspired by the originals (see figure 5), which they incorporated as a part of their game design.

Figure 6: Visualisation by Liv Strömquist, a student visualisation and a play session from video productions

In their final presentation of the 'Period game', the students produced a video showing a player engaging with the game, which was designed as an app that provides scenarios exemplifying issues related to menstruation. This game concept was inspired by Playspent.org, which is a game that one group member played in the first auto-ethnographic exercise of playing a game to reflect upon game mechanics and experiences. The app was created as a paper prototype, and one student acted as the player in the video, discussing her choices (see figure 6) when she encountered challenging choices in the game (Costikyan, 2002). The player assumed the role of a fictive character, a 16-year-old British female from a low socio-economic background. Related to facts that British teenagers sometimes cannot afford menstrual products due to high costs, the character is placed within dilemmas, such as: "*Your period had started this Tuesday morning, but your parents did not have enough money this month for period pads and are too tight in their budget to give you some for the upcoming days. School starts in one hour. What do you do?*" Throughout the game, players must make decisions in relation to economic, health and personal issues related to menstruation. The video production made the struggle in the game visible (Costikyan, 2002), which was used as a reference point for the students to discuss different perspectives of women's periods during the feedback session (Flanagan, 2013; and teaching observations).

Other students were inspired by the different ways to complete the reflexive exercise of making a video recording of a self-chosen game. One student chose to record herself playing a digital game about cultural differences, and she reflected upon how games can focus players' attention on their own stereotyping of other groups. Together with three other students, she formed a group, and they began an inquiry process to explore how a game can foster inviting dialogues and interactions based on cultural issues (Flanagan, 2013; Costikyan, 2002). In the beginning of their design process, the students were keen on making an app as their final game design, but after their second round of peer feedback, they changed their idea. The students wanted to target social aspects of cultural sharing, and the choice of an app as the playground was questioned by fellow students

regarding whether it was the right solution for the purpose. Throughout the course, students were focused on the fact that the game should be playable and in line with their purpose so that it could be tested. This framing was important because they assessed their ideas and adjusted the design during the course. Based on feedback, the students redesigned their initial idea into a board game, which embraced the social aspects of the game to a greater extent. In their final video presentation of their game 'Cultural awareness', the students showed the game play by exemplifying different game situations. The students showed the play situations by starting with a zoom on the specific game card (see figure 7), which invited participants into a dialogue about cultural items and dilemmas (Flanagan, 2013).

Figure 7: Play situations starting with a zoom on specific game cards

Green game cards represented different cultural symbols, and players wrote down their interpretations and afterwards explained their motives for their guesses in plenum. Subsequently, the players negotiated the individual score of one to three points in relation to their answers. In case of disagreement, the presenter of the question has the final word. In a new game situation, one player draws a blue card from the pile and reads aloud: "*Western poet creates his pen name using a Chinese character. Cultural appropriation or inspiration?*" The players then decide for themselves how they will characterise the action of the poet and choose between *cultural appropriation* or *inspiration* while selecting a yellow card representing their choice. Afterwards, players reveal their choices by turning yellow cards, which leads to a conversation about the background of their choices. In their final video productions, the game narrative and endogenous meaning (Costikyan, 2002) of the cultural dilemmas as context-dependent and negotiable became visible in the students' game structure focusing on dialogues and joint negotiations about scores.

As an overall analytical perspective, the students used visual facilitation techniques as they engaged fellow students and teachers in their game narratives through different visual representations, such as visualisations and video productions, making their game designs relatable and discussable in an online setting.

5. Discussion

The analysis has shown different examples of how teachers and students use visualisations and video productions to facilitate and to create a shared online inquiry space, some students with more game and online experiences than others. Some students expressed that both before and after the game course, they were not particularly passionate about games. Despite the lack of interest in games, several expressed that they could find a personal focus in the course, e.g. a political interest in the game culture or an interest in the exploratory approaches and theory presented during the course: "*The texts were many and very interesting and I was amazed by the text on auto-ethnography. There I saw that the theory was not only about games but also about the research approach of ethnographers exploring a certain field and culture within academia approach*." The fact that we combined the academic inquiry approaches with visualisations and video productions as methods familiar to the students (Bang, Friis & Gelting, 2015) can be an explanation of the appreciation of the course despite the lack of interest in games. As another student expressed, her understanding of games was wider after the course which she related to her profession as an art teacher: "*In artistic creativity - when designing workshops or learning class, now I could include different approaches* (…) *Also when thinking about community based art projects, I will definitely remember about games as part of activism"*. This quote exemplifies, how *games for changes* are not just about the specific games, but also about the approaches embedded in the game design when inviting participants to play and to take an active part in critical issues. As this was an exploratory case study of one game course, the student evaluations revolved around the specific course. A long-term

perspective on the implications of combining academic inquiry approaches, visual facilitation techniques, and game theory in higher education, needs further research.

As mentioned, a central point of the game course was for students to take a pragmatic approach (Ejsing-Duun and Skovbjerg, 2018) to explore *games for change* through design based on John Dewey's (1938) concept of *inquiry*. As teachers, we also adopted this explorative approach to develop teaching materials, e.g. visual templates and video instructions based on the dialogue with students from the previous online meeting. Thus, this adaptable way of preparing our teaching had the benefit of students' appreciation of specific weekly feedback in video instructions. On the other hand, when asked about the overall experience of the game course, a student mentioned: "*I wouldn't really change anything. I think that the assignments supported the course and theory and gave the students a good feel of all the different aspects of games. The only thing I would change is the time frames; I would make sure that all the assignments were up weeks before they were due".* An overview of the schedule and all assignments from the beginning of a course could be useful, but it should be up for discussion whether this is doable and suitable when educators have the role of designers of teaching (Sørensen and Levinsen, 2018; Ejsing-Duun and Skovbjerg, 2018).

The analysis has shown examples on how students used visualisations and video productions in their reflective exercises, group work, and to materialize their understanding of course specific themes. The students' visual materials was used in presentations in the online feedback sessions which made game experiences explicit and reference points for joint discussions. Online teaching can be viewed as a social practice where both teachers and students dynamically create and recreate the online learning environment (Goffmann, 1986). In this context, visual facilitation in form of teachers' and students' visualisations, visual templates and video productions was developed as part of the asynchronic course work. Furthermore, in the synchronic online sessions, the students' visual productions were used as representations of group work and game designs driving the feedback and discussion in plenary. Thus, a visual social practice in the inquiry processes was created and recreated throughout the different PBL activities. However, as Blijsie, Hamons and Smith (2019) emphasize, one of the main strategies of visual facilitation is to *draw live* in order to support collective thinking in situ. This strategy of live drawing in plenary should be elaborated in further studies, as potentials for creating more *in situ* drawing sessions could affect the oral feedback discussions, participation and learning. In this perspective, the relation between joint inquiry processes of inventing a game and the act of drawing could be explored as an interaction between student groups and teachers in online settings. This might also call for teachers to frame the online meetings even more student driven (Newman, 2005), making space for students to facilitate the PBL activities and host the online sessions. Thus, the students could be further involved in framing relations between e.g. art and games.

As we discuss analytical results, a limitation of studying own teaching can be our joint roles as both teachers and researchers. In educational design, researchers are not simply observing interactions but are actually "causing" the very same interactions they are making claims about (Barab & Squire, 2004). Therefore, it has been essential to study activities from students' perspectives to understand how they *framed* the teaching situations (Goffmann, 1986). Moreover, in educational design research manifold contexts are conditions, which makes it difficult to replicate others' findings (Hoadley, 2002). In educational design, the goal is therefore not to sterilize naturalistic teaching contexts eliminating all confounding variables, e.g. own involvement, so the generated result is more valid and reliable. Instead, the challenge is to develop flexibly adaptive design interventions and results that remain useful even when applied to new local contexts (Barab & Squire, 2004). By the rich and visual descriptions of PBL activities, student work and reflective evaluations in the analysis, the exploratory case study can function as inspiration for applying similar approaches to new local contexts in higher education.

6. Conclusion

This paper discusses empirical examples of the establishment of shared online spaces for joint design inquiry in the context of games for change across cultural and professional barriers. The study focused on incorporating teachers' and students' use of visual facilitation and representations, e.g. visualisations and video productions, as central parts of creating and framing shared online spaces across the three university campuses. The analysis of PBL activities showed that teachers' video introductions relating theoretical game concepts to the students' group work supported their entrance into the game field as well as their design processes. Thus, the pragmatic abductive approach which starts in own experiences created space for students' more theoretical readings and reflections in relation to the course content of designing games for change. The way to balance feedback-related

video introductions and teachers' time for preparation is identified as a relevant issue for further exploration in online game-based teaching. Students' different strategies of using visualisations and video productions in reflexive exercises and design processes made the game experiences and narratives visible for students across campuses, which enabled further discussions during the feedback sessions and supported the joint inquiry processes. The combination of inquiry approaches, critical game theory and design processes combined with students' visualisations and video productions has interesting connections for bridging gaps between professions, e.g. in art and games. This combination was used to visually facilitate the online joint inquiry space and should be further explored in research studies. For example, the use of live drawing in the online feedback sessions is identified as a relevant focus for further studies in order to explore how these approaches might enhance the joint inquiry processes.

As the aim of the study was to investigate strategies for using visualisations and video productions by both students and teachers to establish a joint online design inquiry, the paper reflects this aim by making the teaching and research process visual through concrete examples in the analysis. Thus, the exploratory case study privilege visual modalities, which are requested in academic practices (see e.g. Mirzoeff, 2002; Bowen and Evans, 2015) and can function as inspiration for applying similar approaches to new local contexts in higher education.

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Paper 5: Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education

Paper 5: Hautopp, H., & Buhl, M. (2021). Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education. *Electronic Journal of E-Learning*, *19*(5), 321-335. https://doi.org/10.34190/ejel.19.5.2466 (published)

The fifth paper represents the second design experiments conducted with a primary focus on exploring the last part of the research question: *How can graphic and visual facilitation support design exploration in higher education?* In this study, we especially focused on a target group of students who were not especially trained in using drawing as part of their academic practice. Building on knowledge from Papers 2 and 4, this paper especially focused on the active role of the teacher in introducing a combination of sketching and graphic facilitation as visual means for developing digital learning designs. This design experiment was crucial in order to gain insights into students' experiences with visual design exploration as a new academic practice for them to enter.

The design experiments in the fifth paper also allowed for an exploration of 'drawings as a means of developing educational designs' (cf. section 5.2) and was a stepping stone for exploring re-designs, e.g. digital possibilities of the use of a document camera to project and transmit drawing exercises to students across campus.

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Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education

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Abstract: This paper reports on how drawing as an academic dialogue tool was explored as a crucial actor for driving design processes among humanistic master's students targeting their digital learning designs for online and blended learning contexts. The paper builds on a previous study that investigated students' use of self-produced visualisations during the digital design process. Although the study did not deal with visualisation and students were not trained to draw, the participants made extensive but unacknowledged use of visualisations. In the present study, a new group of students from the same master's programme were taught how to draw as a central component of the design process in order to investigate how this might expand their use of visual facilitation and drawing techniques to drive collaborative processes, design decisions and theoretical reflections. As design practices enter new interdisciplinary domains, in this case digital learning design, the aim was to explore how humanistic students can act as digital designers by adapting different design approaches and visual methods in particular. Likewise, the study offers an investigation of how students perceive these ways of working in an academic context. The empirical data, including teaching observations, students' visual productions and interviews with 27 students from nine groups after completing the course, were drawn primarily from an explorative case study in which master's students developed digital learning designs to solve a problem framed by an external stakeholder. Students' ways of producing visualisations in the different phases of their design process were analysed in terms of four design genres (explorative, investigative, explanatory and persuasive). The sociomaterial analysis traced how drawings and drawing activities unfolded during collaborative group processes which supported the development of digital learning designs. The findings confirmed the potential of drawing as a means for developing ideas, collaborating in different design phases and presenting and discussing design ideas with peers, target groups and external stakeholders. Furthermore, the findings revealed that drawing activities became a significant pedagogical consideration in the students' digital learning design and data collection process, where students balanced the interplay between initial analogue drawings and digital prototyping, testing their design concepts with target groups. The findings also showed that students perceived drawing and visual facilitation as practical tools but lacked an academic terminology for articulating these processes. The study suggests a need for substantial change to fully acknowledge the potential of drawing as an academic dialogue tool on the level with academic reading and writing when developing digital artefacts.

Keywords: visual facilitation, drawing as an academic dialogue tool, collaboration, digital learning design, higher education

1. Introduction

Western culture has consistently privileged the spoken and written word as the highest form of intellectual practice while regarding visual representations as second-rate illustrations of ideas (Mirzoeff, 2000; Bowen and Evans, 2015). Nevertheless, all scientific disciplines employ visualisations, and each discipline is characterised by a visual culture (e.g. Pauwels, 2006). For designers and architects, the act of drawing or 'sketching' is a familiar element of the iterative process of developing design products (Goldschmidt, 2003). Sketches are used both to reflect on and discuss ideas in design groups and when presenting design ideas to others (e.g. Schön, 1983; Tversky and Suwa, 2009). Within product design, sketches are also used to address and discuss users' experiences with digital products (Buxton, 2007). As design practices enter new interdisciplinary domains, such as learning design and communication design, researchers address the need for students to adapt concrete design methods when developing ideas (Hansen and Dalsgaard, 2012; Ejsing-Duun and Skovbjerg, 2019). When it comes to supporting the actual processes with learning how to design digital artefacts or processes, scholars of the humanities have tended to focus on texts and oral reflections on digital means and overlook the importance of the connected analogue means. Visual facilitation is one example of how drawing and visual methods are used to support group processes in organisations (e.g. Sibbet, 2008). They are based on the 1970s concept of *graphic facilitation* formulated by a group of organisational consultants in California (Qvist-Sørensen and Baastrup, 2020) who were inspired by how designers and architects utilise visualisations and sketching to present their ideas to clients (Sibbet, 2008). In the same way, visual facilitation can be understood as a point of entry to new organisational domains for design practices. However, little empirical research has been conducted on the use of visual facilitation as a formal learning method (Hautopp and Ørngreen, 2018).

Reference this paper: Hautopp, H., and Buhl, Mie., 2021. Drawing as an Academic Dialogue Tool for Developing Digital Learning Designs in Higher Education. *The Electronic Journal of e-Learning*, 19(5), pp. 321-335, available online at www.ejel.org

Other scholars have argued for the use of drawing and visual methods in education. Art Professor Betty Edwards (2012/1979) argued for teaching in drawing as an important part of our educational systems. Her work has received recognition within many fields, and her point of departure is neuropsychology, especially relating the act of drawing to Roger W. Sperry's work (1968) on brain hemispheres. Thus, teaching in drawing is mainly based on an individual cognitive argumentation on how our brain perceives and produces visualisations. In this paper, our focus is turned to the more *collaborative* aspect of using drawing in higher education as a crucial activity in designing digital artefacts. Visual facilitation involves the structured use of pen and paper methods to "facilitate interaction in a group of people, using structured visual content. It is a systematic way of *drawing together with others*" (Qvist-Sørensen and Baastrup, 2020, p. 20, our italics). Thus, in the field of visual facilitation, it is explicitly emphasised that the act of drawing should be accompanied with collaborative discussion among participants. As the visual facilitation has its origins in design, the teaching approach described in this paper draws on various design theories (e.g. Goldschmidt, 2003; Olofsson and Sjölen, 2007) and digital product design (Buxton, 2007). Furthermore, we refer to literature addressing both the term 'visual facilitation' and 'graphic facilitation', but use the term 'visual facilitation' to capture a broader definition of the field.

Previous studies of the use of visual methods in higher education in other domains of knowledge and practice (Gelting, Friis and Bang, 2015; Hyams, 2020; Hautopp and Ejsing-Duun, 2020) have shown that students from the design, architect and art fields benefit from using sketching and visual facilitation as academic practices, as these methods are familiar to them. The present study offers an investigation of the potential of visual facilitation among humanities students who were not familiar with drawing practices compared to design and art students. The inventive process of analogue drawings does not require wider skills: not necessarily a larger vocabulary or unlimited graphic techniques (Goldschmidt, 2003). Rather, what is required is an ability to use the representational act to reason and discuss design ideas (Goldschmidt, 2003; Buxton, 2007). Thus, we consider analogue drawings as an appropriate threshold for humanistic students to begin working as designers in cross-disciplinary fields. However, we argue that *an introduction* to the visual methods is crucial for students to rediscover and consider working this way in academic contexts. The aim was to explore how teaching drawing and visual facilitation can empower humanities students as digital learning designers by adapting visual methods for group work.

The exploratory case study was conducted in the master's programme 'IT, Learning and Organisational Change' (hereafter ILOO) in the Faculty of Humanities at Aalborg University, Denmark. The ILOO master's programme addresses research, development and the implementation of digital learning designs in a range of organisational and educational settings. Thus, it can be digital learning designs targeting the contexts of e.g. e-learning, flipped classrooms, video conferencing and so forth. ILOO master's students typically have a bachelor degree in pedagogy, teaching or computer science. Thus, they are skilled within those areas, but are not specifically trained in using drawing in an academic context. The course chosen for the study, 'IT and Learning Design', teaches students the theories of digital learning and education (e.g. Beetham, 2013) as well as design theories and methods (e.g. Kolko, 2010). As important elements of the course, the students were taught sketching, drawing methods and visual facilitation techniques for use in the digital design processes. In his book "Teaching in a Digital Age", Bates (2019) argues that the most important part of both classroom- and online teaching is how we design the learning environment focusing on collaboration. In this exploratory case study, the students were tasked to take the role of learning designers developing digital learning designs targeting different collaborative learning environments for the contexts of e-learning and flipped classrooms. Inspired by Bates' (2019) suggestions for experimenting with new digital opportunities, the students were encouraged to incorporate a range of different media in their digital learning designs such as text, graphics, audio, video and animation. However, as new technologies are developed and incorporated into media systems, old formats and approaches are carried over from older to newer media (Bates, 2019, p. 205). Thus, we investigated how analogue drawing formats can lay a basic foundation for the students to work visually in new digital formats when developing digital learning designs.

2. Research design

The exploratory case study was built on a Design Based Research approach (hereafter DBR) which focusing on both understanding and developing learning contexts. DBR is based on iterative pragmatic perspectives where researchers design and redesign pedagogical interventions, testing these in natural teaching settings (Brown, 1992). The iterative design of these interventions is a key feature of the knowledge production and results of a

research project (Anderson and Shattuck, 2012; Barab and Squire, 2004). Thus, in the following the iterative design of interventions in this exploratory case study is described.

The exploratory case study was built on a previous study with other students in the same ILOO Course (Buhl, 2018), which did not teach visual facilitation and drawing techniques. The previous study showed that the students performed both analogue and digital visual practices during their design processes, but after finishing the course, they struggled to recall their use of visualisation when developing ideas, design drafts and prototypes. For instance, they had difficulty explaining their actions between the emergence and selection of design ideas and were able to recall the actual practices documented in their report only when the interviewer persisted in requesting examples. The diversity of visualisations identified in the study supports earlier evidence from elementary school settings (Meyer, 2016) showing how digital media support new visual practices, prompting new uses and representations of existing materialities. That study exposed the limitations of students' ability to articulate and reflect on their own visualisation practices, which were nevertheless identified as learning resources at all phases of the design projects.

In the present study, the same master's course was selected, as the aim was to explore how teaching *visual facilitation and sketching* might enhance students' collaborative processes by directing students' attention to the material aspects of drawing practice as a driver for ideation, collaboration, design and prototyping. Thus, an explicit focus was on drawing practices to promote visualisations as a more active participant in the students' meaning-making processes. To study the impact of *teaching* visual facilitation and sketching, a redesign was made of the course (Barab and Squire, 2004): Two drawing workshops were added to the course where the students and the teacher practiced drawing exercises together. Participatory observations were conducted during the workshops together with photo documentation of the students' and the teacher's drawing processes (Cresswell, 2011). After finalising the course, group interviews were conducted to generate knowledge about the students' drawing experiences. From following the activities in the drawing workshops, it was possible to explore the implications of providing an intensive introduction to drawing as a pedagogical intervention (Brown, 1992) to extend existing oral, writing and digital practices within the humanities. Furthermore, we could investigate how students experienced this intervention and how they reflected on the impact from the intervention after having finalised the course.

As we worked iteratively with researching pedagogical interventions, the investigative process involved producing demonstrable design and changes at the local level and reflecting on the use in other contexts (Barab & Squire, 2004). Thus, the research approach is justified by the way the interventions worked in practice by providing a rich description of context, theory and interventions. Researchers within DBR argue that the rich documentation of interventions provides the readers of the research with a foundation to judge for themselves the possibility of achieving similar—or even better results—from the use of the interventions in their own contexts (Anderson and Shattuck, 2012, p. 17). In the analysis, we aim to give a rich and visual description of empirical examples discussed in relation to theories. Thus, the analysis address practice based consequences of the students' use of visual methods when developing digital learning designs for other educational researchers to judge the use of drawing interventions in their own contexts.

In the next section, the pedagogical intervention revolving the two drawing workshop is presented to give a rich introduction to the teaching context (Barab and Squire, 2004) as a point of departure for analyzing the students' reflective use of visual methods when developing digital learning designs.

2.1 Pedagogical intervention: Drawing workshops

The intervention was implemented during the 8-week course 'IT and Learning Design', in which groups of master's students were tasked to develop a digital learning design based on cases provided by external stakeholders. The work was organised as a design-based research process (e.g. Barab and Squire, 2004), involving iterations that included context research, design development, digital experiments and interventions, as well as theoretical reflection and documentation.

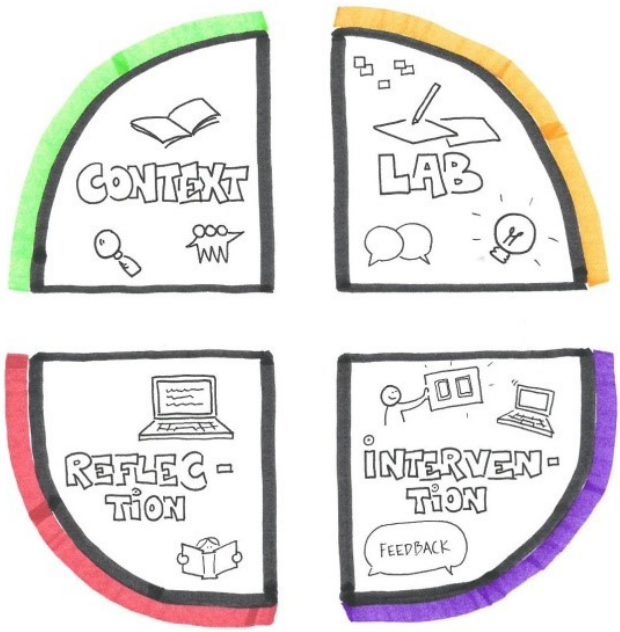

Figure 1: Visual presentation of the four phases in Design-based research (Hautopp and Buhl, 2020)

Thus, the course structure emphasised practice and theoretical knowledge generation as intertwined activities based on the logic of a design process (Buhl, 2016). Seventy students were enrolled in the course at the University's Aalborg and Copenhagen campuses. The drawing exercises were recorded by a document camera and live-projected to a wide screen and through video-conferencing systems at both campuses. To equip the students with tools for the different phases of the design-based research process, the intervention included two workshops introducing the students to *visual facilitation* through drawing exercises, design theories and feedback sessions. The first workshop focused on initial *idea generation* (Schön, 1983; Goldschmidt, 2003; Tversky and Suwa, 2009), while the second workshop focused more on the *presentation* of design ideas (Qvist-Sørensen and Baastrup, 2020). The two workshop designs were based on Olofsson and Sjölen's (2007) mapping of four distinct design genres: *investigative, explorative, explanatory and persuasive.* These describe different modes of entry to the design process. The *investigative and explorative* genres are used to examine the design problem and to share design solutions within the design team. The *explanatory* genre is used to present and communicate a design concept to stakeholders outside the design team, and the *persuasive* genre relates to selling the concept in a marketing context (Vistisen, 2016). In the present study, the teaching intervention prompted students to use drawing in the different genres to gain hands-on experience as active participants by pragmatically testing and reflecting on the potentials and challenges of using visual methods in the design process.

Workshop 1: investigative and exploratory. At the outset, the phrase 'From head to paper—no need for fancy art' was used to emphasise that sketching and visual facilitation are about the act of developing, reflecting and communicating ideas rather than artistry (Valenzia and Adkins, 2009). As design proceeds from pragmatic ways of working (Hansen and Dalsgaard, 2012), the teacher first introduced drawing exercises involving the use of simple icons and elements to illustrate *people, places and processes*, using *speech, text, colours and effects* to highlight key words and elements (Qvist-Sørensen and Baastrup, 2020).

Figure 2: Wide-screen projection of teachers' hand drawings by document camera (left) and students' drawings (right)

Afterwards, the students were asked to *investigate* the design problem through drawings – first as a 10-minute individual assignment and then as a collaborative *explorative* exercise, in which they shared their drawings with each other and discussed ideas, potentials and barriers.

Workshop 2: explanatory and persuasive. As a point of departure, this workshop elaborated different theoretical perspectives on the use of drawings in educational settings, beginning with an introduction to visual facilitation (e.g. Sibbet, 2008) and how drawings and visual methods can be used for knowledge construction and representation (Bowen and Evans, 2015) in university teaching (Bang, Friis and Gelting, 2015). These theoretical concepts were combined with examples from the teacher's own empirical research and teaching in design and the humanities to show how drawings can be used as data collection tools for field notes (Causey, 2016) and interviews to elicit informants' visual imagery (Qvist-Sørensen and Baastrup, 2020). In the present study, the students were guided to use drawings in the different phases of their projects. After the presentation, they were prompted to draw more specific visuals related to aspects of their design problem (e.g. collaboration, digital devices, learning barriers and innovative and creative processes). In both workshops, the students were encouraged to offer feedback and to reflect on their hands-on drawing activities, relating these to the theories and methods of applying visual techniques in academic practices.

2.2 The teacher as a role model for 'actually' drawing

As our educational system has typically declined to use drawings as an acknowledged medium of learning after elementary school (Lyon, 2020), students in higher education may struggle to use drawings as they have unclear expectations of what is perceived as 'good', 'bad', or 'artistic' drawings, for example. Likewise, students may perceive drawings as something 'childlike' or 'childish' (Lyon, 2020, p. 5) due to the socio-cultural environment where they only associate the act of drawing with their childhood and elementary school. Opposite to students' experiences, we wanted to introduce drawing as a collaborative practice and as a crucial actor for designing digital artefacts. In this perspective, the teacher had an important task of being a 'role model' *drawing* together with the students not focusing on 'artistic' drawing, but instead directing drawings to the academic purposes of problem solving and collaboration (cf. the teacher's introduction phrase 'From head to paper — no need for fancy art', which was repeated throughout the course to minimize artistic expectations from the students). Frank and Madsen (2020) also expressed how the teacher's introduction to basic skills within visual facilitation slows down the pace and shows the *process of drawing* for the students to follow. In this paper, the teacher's use of a document camera and video conferencing made it possible for students across the two campuses to follow the drawing process while making their own basic drawings (see figure 2) as inspiration for implementing drawings in their further design processes. Thus, the workshops were not intended to deliver exact instructions for working with drawings, but to introduce a visual repertoire to develop students' skills and awareness regarding the use of visual methods as tools for design and collaboration in higher education. A further aim was to assess whether and how these drawing workshops would impact students' design activities during the rest of the course and to study drawing as an integrated part of digital designs.

2.3 From analogue drawings to digital prototypes

Buxton's (2007) book about sketching user experiences revolve around product design with an emphasis on products that have a dynamic behaviour due to the incorporation of embedded digital technology. Buxton argued for a more experience-oriented design approach instead of an object-oriented one. In the context of this exploratory case study, students were tasked to develop digital designs to spur and support learning experiences among a target group.

Despite the accessibility of analogue drawing techniques (Goldschmidt, 2003) it is emphasized that the act of drawing sketches requires practice (Buxton, 2007), but teachers' introduction of basic drawing techniques is seldom prioritized in education (Edwards, 2012; Lyon, 2020). In this paper, we focus on introducing non-designers –humanities students – to simple drawing techniques to give them a point of departure and inspiration to drawing their ideas in the initial design phases. The purpose of this 8-week course was not to educate them as full-blown designers, but to invite them to materializing their ideas in *designerly* ways (Hansen & Dalsgaard, 2012); that is, producing, reading and redesigning through analogue drawings entangled with digital experiments.

Based on Buxton work (2007), we argue that sketches and prototypes are both instantiations of the students' digital learning design concepts. However, sketches dominate the early ideation phases, whereas prototypes are more concentrated at the later stages where things are converging within the design funnel (Buxton, 2007, p.139). As Olofsson and Sjölen (2007) expressed, design development represents the interplay between different genres where sketches and prototypes serve different purposes. In this exploratory case study, the focus was mainly on the students' development of the digital learning design *concepts* with less focus on the related attributes of cost, timelines, quantity and disposability and so on. which typically are tested through prototypes as more constituted designs (Buxton, 2007). Thus, the empirical data revolves primarily around the initial design phases as a crucial starting point for creating digital learning designs. Hence, this involved the students' reflection about the introduction of drawing techniques as a tool for the early design phases supporting the students' ideations and discussions of digital learning designs. Therefore, to work experience-oriented with different digital media, the students firstly were introduced to analogue drawing techniques (Qvist-Sørensen and Baastrup, 2020) to drive their initial ideation and discussion of different digital opportunities (Bates, 2019) before concretising their ideas in digital prototypes (Buxton, 2007).

After the two drawing workshops, the students were asked to work with different types of digital prototypes to further develop their digital learning designs based on their analogue drawings. Some of their choices included the Marvel app programme, the Sketch programme and Adobe XD. The connection between the analogue drawings as a foundation for developing digital prototypes will be elaborated on in the analysis. Buxton emphasised how prototypes, but also sketches, enable iterative user involvement, participation and testing much earlier in the design process (Buxton, 2007, p. 143). Thus, the analysis will contain examples of how students use different kinds of visual materializations of their digital learning design concepts when testing their ideas with peers and target groups.

3. Theoretical framework

In this section, the theoretical point of departure is outlined in order to analyse and discuss drawing as an academic dialogue tool and to address how this visual practice becomes a part of social learning processes.

3.1 The social function of drawing in education

To challenge academic privilege of the spoken and written word (cf. Mirzoeff, 2000; Bowen and Evans, 2015) we elaborate on why drawing should be acknowledged as an academic tool when students collaborate and acquire new knowledge in higher education. We seek to outline the potential and the research in drawing related to education and how insights should be expanded across disciplines.

In her PhD project "Learning through drawings – investigation into Danish Architecture Education" Inger Louise Berling Hyams (2020) investigated what role drawing plays in architectural education. Drawing has a special role in design and architecture education, since much of the learning and transfer of knowledge passes through drawing rather than regular language (Goldschmidt, 2003; Twersky and Suwa, 2009; Hyams, 2020). Thus, architectural educational discipline can be characterized as a field where the act of drawing is a commonly used practice and can serve as inspiration for other educational domains.

As part of her PhD project, Hyams developed what she calls 'drawing epistemology' (Hyams, 2020, p. 196) which are linked to different historical paradigms of working within architectural education. Hyams explained that she puts 'drawing' first to emphasise that as an architect student, you achieve experiences *through* the act of drawing. Therefore, drawing is set before epistemology, rather than the more grammatically correct form of the 'epistemology of drawing', where epistemology comes first and not as a dependent of drawing. Here, Hyams also clarified the interrelation between the architect and the materials, defined by Donald Schön (1983) as the backtalk and dialogue with materials. Hyams' PhD project concentrated on architectural education and did not link the pedagogical considerations to other fields where particular drawing practices and the relation to thinking might be studied. However, our argument is that the concept of 'drawing epistemology' can be relevant to exploring within other disciplines in higher education.

Primarily, architectural drawings have an end goal of concrete buildings. Even though architects do not build buildings, they do drawings that are built for someone else (e.g. engineers and construction workers) to realise (Robbins, 1994, p.104). In this field, drawings have different functions ranging from abstract ideas to hard-line working drawings, which bridge different aspects of architectural practices (Robbins, 1994 in Hyams, 2020, p. 183). Based on Hyams' empirical work of interviewing architectural students, she concluded that students both see the drawings as an ongoing dialogue with their ideas (cf. Schön, 1983) and at the same time some students emphasise a purpose about that the drawing should be able to speak for themselves (Hyams, 2020, p. 184).

As we investigated the use of drawings when students worked with developing digital learning designs, the end goal was not merely concrete *buildings* (it might be an app or a website), but rather a suggestion for enhancing learning processes and collaboration processes. Thus, some kind of *process* is considered the end goal of the design process, where we consider *visual facilitation* as a relevant drawing genre for this purpose. Visual facilitation is not about depicting reality; instead, it is about representing ideas and icons in relation to other ideas illustrated on the basis of participants' contributions in the dialogue (Valenza and Adkins, 2009). Thus, the purpose of the drawings' self-communications is not as relevant, as drawings are always used and implemented in a dialogue surrounding the drawings (Qvist-Sørensen and Baastrup, 2020).

With their practice-based book *Draw to Learn* (2020), Nanna Frank and Anne Madsen made a teacher's guide for using graphic facilitation in educational settings. They take a point of departure in elementary school but wished to inspire anyone working with learning as a central part of their job. They emphasised the idea that in graphic facilitation, the use of drawings goes from being art or creative expression to becoming a strategic tool to *enhance communication* (Frank and Madsen, 2020). The visuals play an important role in the facilitation of complex contexts which are up for discussion with multiple stakeholders. Thus, the drawings are especially targeted to be a part of a dialogue centring on what the authors express as 'meaningful learning communities' (Frank and Madsen, chap. 1). The cases presented in the book are based on the authors' own experiences of using graphic facilitation, however, presented as fictional narratives. Thus, they present rich practice-based examples from elementary school, yet research is needed as well as examples from other educational contexts.

3.2 Drawing as an academic dialogue tool

In our study, broadening the educational contexts of where drawing practices are taught and being studied as a part of students' academic work was our aim – not least in the disciplines of digital design in the humanities that traditionally are oral and textual. Hyams' (2020) notion of 'drawing epistemology' was considered important in discussing the potential of drawing practices for learning. At the same time, when teaching of drawing was applied to the field of humanities, Frank and Madsen's (2020) notion of creating 'meaningful learning communities' became important to see *drawing as an academic dialogue tool*. Thus, we perceived visual facilitation as a systematic way of drawing together with others (Qvist-Sørensen and Baastrup, 2020) and as an academic driver (Hyams 2020) to enhance communication (Frank and Madsen, 2020) when students develop and present their digital learning design ideas (Olofsson and Sjölen, 2007; Buxton, 2007). As mentioned earlier, the basic drawing exercises were seen as an introduction to a visual repertoire to develop students' skills and awareness regarding the use of visual methods as an academic dialogue tool for design and collaboration in higher education. The social functions of the drawings are further elaborated upon in the next theoretical section.

3.3 Understanding drawing as social and material

As addressed above, our approach to drawing was an academic dialogue tool characterized by being social, communicative and process-related. Understanding the students' visual actions was seen as situations of emerging meaning-making in the social and material interactions with the actual drawing and in dialogue with peers. Thus, visualisation was investigated as part of a the social learning process in which drawings and other materialities – including digital materialities – served as agents of meaning-making. Some scholars (e.g. Fenwick and Landri, 2012) have argued that we must look beyond the dichotomy between human intentionality and non-human objects for a fuller understanding of learning processes. Latour's (2005) actor-network-theory (ANT) prompted some researchers (e.g. Meyer, 2016) to adopt a broader perspective on empirical learning situations as complexes of social and material agency. Fenwick et al. (2011) argued that ANT offers the potential to rethink existing practices and to reframe conventional views of pedagogical practices in the humanities. They contended that learning consists of social material processes involving both human and non-human agency in a continuous flow of events (e.g. schedules, digital access codes, desks, pencils, stories, chewing gum and electricity) that participate in meaning-making. Rather than separate objects in a classroom, these were seen as collections of patterns of materiality that change and interact with human energies. Materialities, such as textbooks, tablets, discourses and learning models, offer different forms for participation in learning for a while, and these practices will in time spread to other learning environments and then later disappear. In this way, learning emerges from a continuous social practice of materialities of 'doing', to which meaning is attributed. Fenwick and Landri proposed the term *hybrid assemblages* to describe 'the continuum of materials, ideas, symbols, desires, bodies, natural forces, etc. that are always active, always reconstituting themselves' (2012, p. 3). In the present study, these hybrid assemblages served as the context for the empirical analysis of visualisations and their role in the design processes, tracing how drawings interact as active participants in the process. From this perspective, teaching, drawings, digital prototyping and the students' acts of drawing are entangled in the hybrid assemblage that constitutes the design process, including reservations towards the status of drawing in academia and the humanities (e.g. Mirzoeff, 2000; Bowen and Evans, 2015) and may be ideas of a requested aesthetic and self-communicative product (e.g. Hyams 2020). Furthermore, the hybrid assemblage may contain ideas of a childish preschool activity (Lyon, 2020). Therefore, investigating drawing as an academic dialogue tool in group processes requires a theory that captures the social dimension of drawing for learning. Our framework incorporated Wenger's (2000) account of social learning, which emphasises that learning happens socially and is negotiated through collaborative processes. This approach enabled us to explore how the students in our study attributed meaning to drawings and the act of drawing in combination with their digital design experiences when we interviewed them after completing the course.

4. Analytical approach and empirical data

Our suggestion of drawing as an academic dialogue tool for meaning-making was based on insights from practices within the professional domains of drawing. Together with sociomaterial and social learning theory, this constituted the framework for analysing the empirical data. Social material theory suggests overcoming the dichotomy between the analogue and digital material by approaching both as entangled actors in the hybrid assemblages. Before presenting our data analysis, it is useful to briefly outline our approach to the empirical material. Visual research is not only *about* the visual but also involves working *through* visuals and visualisations (Pauwels, 2006). For example, while semiotic analysis and content analysis are primarily used to explore visual objects themselves, field research is more appropriate for studying practices, experiences and processes related to the creation and utilization of those objects (Pauwels and Mannay, 2020). By tracing the visualisations as participants in hybrid assemblages, the sociomaterial perspective adopted here primarily focused on the students' practices and experiences rather than any thorough analysis of the *visual artefacts* themselves (e.g. composition and aesthetic qualities). The analysis concentrates on what Pauwels and Mannay (2020) described as *production context* and *utilization context*, tracing the becoming of the drawing and its different uses as an artefact in the four design genres (cf. Olofsson and Sjölen, 2007; Pauwels and Mannay, 2020; Fenwick and Landri, 2012).

The empirical data included participatory observations during drawing exercises, post-course group interviews with 27 students from nine groups of 2–4 students and the visual products of the group design processes. The interview guide was designed and aligned with the *design based research* approach (Barab and Squire, 2004) as the overall structure of the course, inviting the students to reflect upon their design processes and use of visual facilitation and sketching throughout the different design phases. The interview guide was planned by the authors on the basis of their participatory observations of teaching (Cresswell, 2011) and students' visual

productions. However, to encourage students to speak more freely about their experiences, the interviews were conducted by a research assistant. The interviews were video-recorded and afterwards analysed by the authors, drawing on thematic analysis (Braun and Clarke, 2006). The following themes were identified in the empirical data which will be elaborated, analysed and discussed in the next sections:

- Drawing used as a driver in students' collaborative group work and theoretical reflections
- The drawings' diverse material agency for students' empirical data collection
- The role of analogue drawings and digital prototypes in students' feedback sessions
- Students' perception of drawing as a new mode of academic work

As part of the DBR approach, we have described the pedagogical intervention where drawing techniques and design theories where introduced to the students in two workshops (Barab and Squire, 2004). The interviews with students function as the primary focus for the empirical analysis on how the students experienced and reflected on the use of these visual methods for meaning making in their collaborative design processes.

5. Analysis

5.1 Drawing used as a driver in students' collaborative group work and theoretical reflections

Echoing previous findings (Buhl, 2018), students talked about how drawings concretised their ideas and functioned as participants in the negotiation of meaning (Wenger, 2000): *'It seemed like we were talking about the same thing, but when we visualised it, it turned out that we were not. It was the tool that helped us'.* The drawings and the act of drawing also participated in group decision-making processes as the design elements became explicit: *'For each input, we talked about it and then sketched it. After it was sketched, one could see whether there was something wrong with it, or, well as soon as it was sketched, then one saw … if it was okay—does it work, or does it look confusing or stupid or something'.* In this way, the students entered an *exploratory* dialogue with the materials (Goldschmidt, 2003; Olofsson and Sjölen, 2007), exemplifying the complex social and material agency of collaborative group processes (Meyer, 2016).

Another group emphasised the importance of drawing *together*: '*We all had the idea, the same idea. But when it came down on paper we realised it was not the same idea. Through the act of drawing together, we acquired a joint understanding, all three of us. It meant a lot for us*'. Here, it can be argued how *through* the act of drawing *together* the students enhance their understanding and communication (Hyams, 2020; Frank and Madsen, 2020) of what seem to be a 'joint idea'. This group further elaborated on how the act of drawing became a significant actor in their idea development of a learning design app: '*Actually, in the beginning we only had ideas of the functions "spin" and "chair". We did not have the idea about "create", we only got that through drawing. Here, we became aware that something was missing* (in the app)'. In this example, the drawings led to new ideas and became an important part in the social negotiation processes (Fenwick and Landri, 2012). Furthermore, the empirical data showed how the students were able to discuss, for example, the technical functionalities in their digital learning designs. A group emphasised how the act of drawing made it possible to discuss details about their digital learning design: '*The drawings created an overview and made it possible to discuss details* (…) *When you make drawings, it becomes evident how many elements and processes which are actually necessary when developing an app*'. Another group explained how the quick drawings made the collaboration about the functions in the learning app more discussable: '*In the sketching phase, you can go into particularly details "Oh yes, we need a button there and what will be needed over here*?"'. Here the student was imitating a group dialogue around the digital learning design, and it can be argued that the quick drawings made it possible to discuss the relation between the digital functionalities and possible user experiences (Buxton, 2007) in different utilization phases (Pauwels and Mannay, 2020). The students' experiences indicated an acceptance of drawing as a meaningful actor, and the interviews reported that it helped to maintain the students' focus in negotiating the multiple aspects regarding, for example, the relation between digital elements and users' learning experiences.

Maintaining a focus on their own drawing experiences enabled the students to reflect on the possibilities of integrating drawings as a modality in developing their learning designs. One group described how they integrated experiences from their own drawing processes into a digital learning design to facilitate teaching about innovation in an online learning context. Their external case related to teacher education; the design question asked how student teachers could be supported when developing teaching materials for innovation. Emphasising the material aspect of learning (Fenwick and Landri, 2012), one student said: '*You can talk about innovation, but how might you make a design about it? How can we make a product that supports [the process*

of innovation]? In other words, we can talk about it, but how should it look visually?'. The student explained how the group '*went through an innovative process*' in using sketching and visual facilitation, and they later included this in their design of an innovation app for others to use as part of their own learning process. In other words, this group used their own *production* of visuals to reflect on their target group's *utilization* phase (Pauwels and Mannay, 2020). The example show how students reflected on and applied their own experiences of drawing in developing a learning design, and it can be argued that the drawings also prompted pedagogical considerations (Beetham, 2013) when the students took on the role of learning designers.

5.2 The drawings' diverse material agency for students' empirical data collection

In this section, we describe how drawing materialities were traced from group processes to participant involvement in data collection, with examples of how students used their own experiences of visual facilitation in the data collection phase. As mentioned earlier in the drawing workshop, the students were encouraged to use drawing activities both as part of their design processes and for empirical research (e.g. Qvist-Sørensen and Baastrup, 2020). The interviews further revealed that some of the groups used drawing activities in their initial field work, thereby involving their target group in the collaborative design process. One group of students described how they used various digital and analogue means to design prototypes in the exploratory and investigative modes (Olofsson and Sjölen, 2007) and later included drawing as a social activity in their field studies to involve participants in idea generation for the purposes of data collection: '*We had a user participant workshop in which participants made some sketches that we worked on in the Sketch programme later the same day. We included their sketches so that participants could see the process as well*'.

During the process, the students moved between materialities, using hand drawings and the Sketch programme and switching between the four design genres (Olofsson and Sjölen, 2007), beginning with their own exploratory mode when preparing the workshop. Next, they invited participants to draw their ideas, leading later in the day to a more explanatory mode, where different ideas were presented and discussed using the Sketch programme.

From a sociomaterial perspective, the drawings' material agency can be seen as playing an important part in empirical knowledge creation. One student commented on the surprising insights they gained about the target group through the drawing exercises, as the drawing process opened a mutual space for reflection: *'I think that in every process shared with them, in every moment spent with them in a reflection space of some kind, there appeared some sort of groundbreaking new'*. For instance, the group initially thought about including gamification elements in their digital learning design, but the participants' drawings and the subsequent discussion made it clear that the focus should be on accessibility and social activities.

One group commented on the new insights they gained into the elements of their design during a user workshop: *'We found that there were icons we made for the prototype that they could click around in while some of the icons we had used had to be replaced because they sent a different signal'.* On that basis, the students adjusted the design to better suit the utilization context (Pauwels and Mannay, 2020). Another group reflected on how they integrated the participants' ideas in their final prototype*: 'From the physical sketches they made, we talked a lot about how we could include their ideas. (...) The logo we made—actually, one of the young ones from the club made the logo that we chose to take further'.* In this way, a participant's initial drawing achieved agency in the hybrid assemblage (Fenwick and Landri, 2012) that constituted the design concept targeted a blended learning context.

From a sociomaterial perspective, the drawings could be traced from the students' design processes to the participatory workshop, where the design ideas were developed and redesigned on the basis of participants' drawings and joint discussions. In this way, the drawings spread from one learning environment to another (Fenwick and Landri, 2012). In these processes, the student groups showed a flexible approach to the four design genres proposed by Olofsson and Sjölen (2007), with an increased focus on participants' experiences and feedback. This is also an example of how the students balanced the interplay between initial analogue drawings and digital prototyping in the Sketch programme, driving the design process from ideation to a more constituted design based on the participants' experiences (Buxton, 2007).

5.3 The role of analogue drawings and digital prototypes in students' feedback sessions

The above-mentioned examples show how students reflected on their own drawing experiences and how they related these to their development of digital learning designs and conducting data collection. Throughout the

interviews, the students also elaborated on how the continuous peer feedback was an important driver for development in their design processes (e.g. feedback exercise from drawing workshop 2).

The visual materials were emphasised as an important actor of both driving the process and presenting ideas in the feedback sessions with other student groups and stakeholders, as the students in the different phases acquired new insights about their learning design (Fenwick and Landri, 2012; Wenger, 2000). One group explained how they went from one initial idea to another, which was largely reduced after a feedback session with fellow students and teachers. In that session, they went into explanatory mode (Olofsson and Sjölen, 2007) using their sketches as a dialogue tool (Frank and Madsen, 2020): '*My goodness, it was a large project. Our second prototype was huge and we could not explain it which we realised at the feedback seminar'.* Due to the experience of not being able to explain their design, the students realised that they had to narrow their focus to create a digital learning design which should inspire a meaningful learning community (Frank and Madsen, 2020). Another group also reflected on receiving feedback on their design ideas: '*It was when we presented our design ideas to another student group that we realised that our design needs to be understandable for others. We know our idea, we know how the app works, or at least it works for us, so it was quite interesting to see what others did not immediately understand*'. The feedback session enabled the students to discuss in more detail the utilization context of their digital learning design (Pauwels and Mannay, 2020), which supported the relation between the materialisation and the academic dialogue.

As the examples below will show, the students used different materialities when presenting their design ideas in the feedback sessions (e.g. analogue drawings as prototypes on paper, the Marvel app Programme, the Sketch Programme and Adobe XD). A group was observed showing how they produced and arranged different drawings as a prototype while presenting their work to the other student groups (opponent group) in a user test session. The user test showed that the drawings framed in a mobile telephone made the user experience explicit and easy for the test group to follow and comment on.

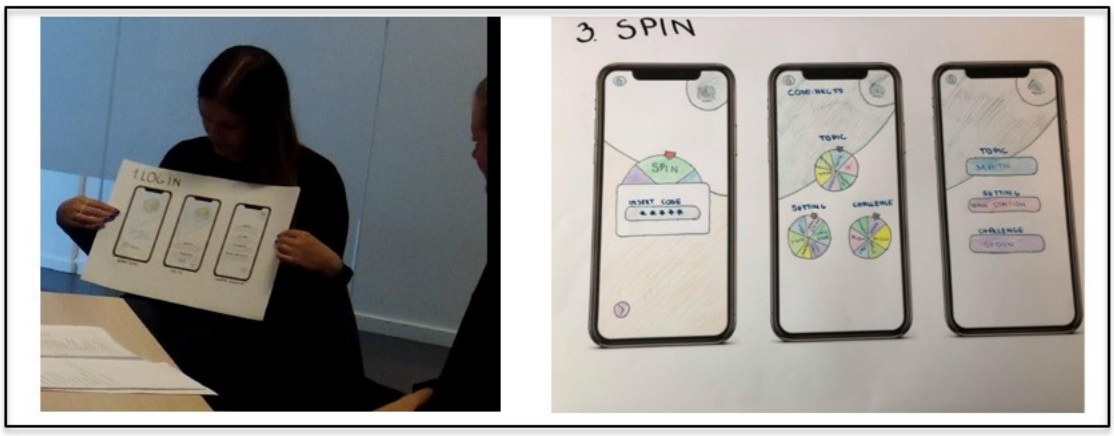

Figure 3: Students' prototype on paper showing a user experience of their digital learning design idea

The opponent group emphasised the following in their feedback: 'It was easy to follow your prototype on paper visualized as a mobile phone (…) I could easy follow from log-in to the different elements and activities in the app'. Another group had chosen to take the insights from their initial drawings phase and made it into a digital prototype in Adobe XD. Their opponent group emphasised the constituted format (Buxton, 2007) of the digital learning design: 'You have designed it very well; it looked like a real website and you explained it well. It was easy to follow your design ideas'. The opponent group addressed the fact that the students could press on the navigation buttons in the prototype in Adobe XD as "a dynamic experience".

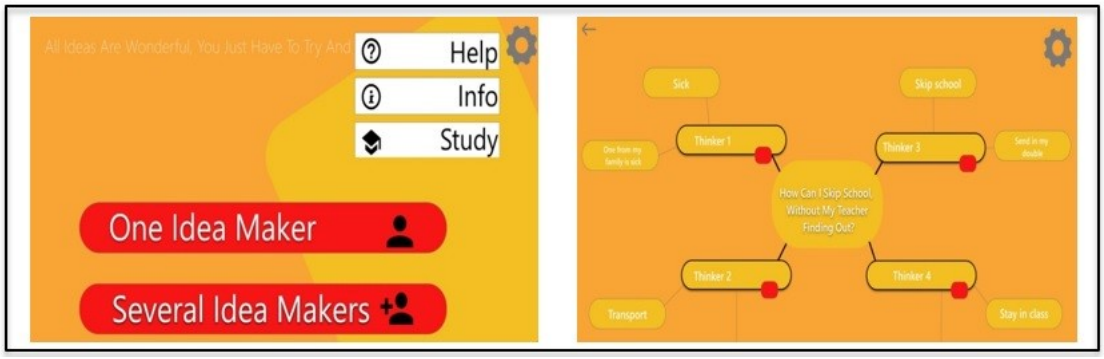

Figure 4: Students' prototype in Adobe XD showing a user experience of their digital learning design idea

The two groups had chosen differently when presenting their design ideas in the explanatory mode (Olofsson and Sjölen, 2007) and further discussed the different affordances of the modalities. Even though the dynamic character of the navigation in Adobe XD was appreciated, limitations were mentioned by the group who made the prototype, because '*you cannot do everything in a prototype programme*'. Moreover, the analogue drawings in the prototype on paper was emphasised as crucial to snow the user experience: '*Your layout with the mobile phone made the user experience evident of what will follow in the next phase*'. The student who had made the Adobe XD prototype explicitly expressed her reflection about the analogue format comparing it with the digital format: '*It think it works just as well as the digital format. I really liked that you have used drawings* (…) *I really enjoy drawing and I would like to become better*'. The above-mentioned dialogue showed the students reflections about working from the analogue drawings in the initial design phases to a more constituted design format in the presentation drawings (Qvist-Sørensen and Baastrup, 2020) and the digital prototypes (Buxton, 2007).

Several groups expressed their appreciation of starting in the basic drawings, which led to further development and concretization of their digital learning design concepts. One group elaborated on how the feedback sessions showed the diversity in digital design solutions among the student groups: '*It was pretty amazing to see how different our design ideas had turned out*' both in regard to the visual layout of the designs but also how the different student groups had solved the task framed by the external stakeholder. Another group elaborated: '*We have got a quite different perception of what the stakeholder needed compared to our opponent group. At the same time the designs have similarities because we still incorporated some of the same points* (in the design). *However, they are completely different; I find that enjoyable*'. The examples showed how the drawings and visual representations became a crucial actor (Fenwick, 2012) when presenting a variety of design solutions. Likewise, the interviews showed the students' reflective experimentation of different analogue and digital media (Bates, 2019). Some students furthermore expressed a wish for more introductions to the different programmes for producing digital prototypes in the explanatory phase (Olofsson and Sjölen, 2007), which could guide a more constituted design presentations (Buxton, 2007). Thus, further studies could have a more specific focus on the production of digital prototypes based on the initial analogue drawings.

5.4 Students' perception of drawing as a new mode of academic work

The final analytical section will revolve around the students' perceptions on drawing as an academic dialogue tool for developing digital learning designs. Several students confirmed observations during the drawing workshop that the taught drawing exercises were meaningful and applicable to their own design processes, as in this example: '*We implemented several things from the teaching, so I think, that this...I think it made a lot of sense'.* Others referred to how the drawings and visual facilitation guided their collaborative group processes: '*We realised that it was probably the lecture that was most beneficial...to guide us in the right direction and on the same path. It was simply an eye-opener as to how one could actually express one's ideas in another way'.* From a sociomaterial perspective, the quotes generally confirmed how the entanglement of teaching exercises, drawings and discussions (Fenwick and Landri, 2012) became meaningful as the students reflected on how the act of drawing supported their collaborative design processes.

Several groups also addressed how the use of drawing was a new way for them to do academic work even though they did not approach the drawing practice theoretically. One group reflected on how they used drawings throughout the design processes and how this tool has been beneficial to learn: '*We have used*

sketching a lot throughout the design process and we think it is a really great tool we have learnt.' This group also emphasised how they used the drawing workshops as an important space for their design development and group discussions: '*Actually, we have used a part of the teaching to develop our design as we all did some sketching and then talked about our design*'. Three other groups explicitly mentioned how the drawing workshops helped them overcome the barriers of drawing. One student explained, '*In general the two teaching workshops about sketching, it was really good. Because I think many of us had barriers like "fuck, I cannot draw" and "how do we ever get to sketch something?" and then she (teacher's name) showed drawings super simple; that was just really good*'.

As well as providing basic drawing skills and a visual repertoire, the findings indicate that the workshops lowered the students' barriers for drawing in an academic context. Thus, the students' reservations towards drawing (Lyon, 2020) were met by introducing simple drawing techniques (Qvist-Sørensen and Baastrup, 2020; Frank and Madsen, 2020) and by inviting the students to further develop their own visual repertoire suiting their design processes.

When asked directly about whether sketching theories had been a part of the students' design consideration, several groups rejected that it had been a part of their processes. They explained the more practical function of drawing in their group processes: '*getting ideas down on paper*' and '*we probably used it more as a way to get clarity and insights about each other's understanding about the design ideas*'. Even though the drawing exercises in the workshops were combined with theoretical and methodological theories within the field of design and visual facilitation (e.g. Goldschmidt, 2003; Twersky and Suwa, 2009; Qvist-Sørensen and Baastrup, 2020), the students' comments indicated that these combinations were not present in their experiences of the course.

The findings show that students reflected on how drawing as an academic dialogue tool for developing digital learning designs can be beneficial for their group learning processes and their design processes. They acknowledged their initial barriers towards the act of drawing and found the teaching valuable for engaging in the drawing practice. Despite the introduction of theory supporting the visual methods, the students mostly considered drawing, sketching and visual facilitation as practical methods.

6. Discussion

Our findings confirm that teaching visual facilitation and recall of students' drawing experiences helps students to realise the potentials of visualisations for learning as well as to explain their actions and selection of design ideas. The very activity of drawing has the potential to stage processes in which presuppositions can be tested, rejected and replaced by an open mind to address actual problems and serves as a prompt and direct way to share initial ideas and flows. Furthermore, the findings show that the drawing activity is entangled with digital activities as the students balanced the interplay between initial analogue drawings and digital prototyping e.g. in the Sketch programme. Concretisation in the different design phases promoted clarity in the development of ideas, facilitated collaborative processes and supported idea generation and discussion that were tested and further developed in combination with digital prototyping. Based on the initial analogue drawing techniques, a more thorough focus on developing digital prototypes (Bates, 2019) integrating digital sketching tools (Buxton, 2007) is suggested as a future research scope within the humanities.

When asked, the students lacked the theoretical and methodological terminology to specify what their drawing experiences achieved, as they used common language to narrate their actions. However, these narrations drew on the richness and diversity of visual materiality in driving social learning processes forward. For more theoretical reflections on the use of drawings and visual facilitation in academic practice, it can be argued that visual methods should be assigned a more prominent position as material participants on an equal footing with other materialities. This includes an extended knowledge about the theoretical foundation of drawing, which the students had not achieved. A continuous and explicit focus on relating practical drawing activities with theories are crucial to develop a more acknowledged visual learning culture in higher education.

By enlisting drawing as the primary materiality in this sociomaterial framework, this study can be understood as an instance of hybrid assemblage including both analogue and digital materialities. Nevertheless, this approach was found to be productive to the extent that it required us to focus on the actions occurring between the students and the drawings as a valuable encounter between human and non-human actors. In the student

interviews, it was demonstrated how the drawing processes drove the design processes and took the collaborative work with the target group in new directions.

These findings also suggest that teaching drawing and visual facilitation as a pedagogical intervention impacts learning outcomes. Despite a lack of emphasis on visual education in Danish schools (Rasmussen, 2017), the students engaged with the workshop exercises and were able to reflect on them. Even though the students were positive towards the use of visual methods throughout their digital design processes, the findings also confirmed that these approaches were unfamiliar based on their previous educational experiences. If visual teaching activities are not continued as an integral part of their future courses, it remains to be seen to what extent students will continue to use drawing as an academic dialogue tool for learning, as the programme does not formally assess visual competences. Thus, curriculum organizers and teachers play an important part in maintaining a focus on drawing as an academic dialogue tool across academic disciplines.

Finally, the study showed that drawing activities became a significant pedagogical consideration, as students seemed more likely to use drawings as a tool for digital learning design and for involving their target group in the participatory workshops. Their flexible use of different design genres (Olofsson and Sjölen, 2007) indicates an interesting direction for further studies of what emerges when design practices enter new interdisciplinary domains (Hansen and Dalsgaard, 2012). As the empirical data in this study were limited, the intention was not to generalise the findings to other settings, but to investigate these students' understanding and use of visual methods in their digital design processes. As mentioned earlier, the results from this the exploratory case study can function as inspiration for applying similar interventions and visual methods to new local contexts in higher education (Anderson and Shattuck, 2012).

7. Conclusion

This paper provides empirical examples of how academic practices in higher education can benefit from a combination of different design methods, visual facilitation and drawing techniques as a means of enhancing students' development of digital learning designs. The study results are suggestive for teachers and researchers teaching design methods to students in educational contexts. From a sociomaterial perspective, the analysis followed students' drawings and the act of drawing through collaborative design processes and showed how these had implications for meaning- and decision-making when designing digital artefacts targeted different online- and blended learning contexts. The paper offers an investigation of *drawing as an academic dialogue tool* when developing digital learning designs, which was seen as playing an important part in students' pedagogical considerations about digital learning designs and data collection. Here, students balanced the interplay between initial analogue drawings and digital prototyping, testing their design concepts with peers and target groups. The present study confirms that visual facilitation has the potential to provide valued and valuable learning experiences, but further research is needed to assess the long-term implications of teaching drawing techniques and visual facilitation in such contexts. To support this research, future teaching in higher education would need a substantial change to fully acknowledge the potential of drawing as an academic dialogue tool on the level with academic reading and writing. Not least in the light of a growing digitalisation involving a range of different media in higher education. In this paper, we have shown the interplay between students' analogue drawing and their development of digital learning designs. Future research could expand the field of how analog practice may enhance digital practice in academic learning in the Humanities.

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Paper 6: The process from teaching to assessing students' designerly and creative ways of working in higher education

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The sixth and last paper was the third design experiments conducted with a primary focus on exploring the last part of the research question: *How can graphic and visual facilitation support design exploration in higher education?* This design experiment took a point of departure in the pedagogical intervention described in Paper 5 and explored a further development of the educational design. Thus, the study investigates how the use of visual facilitation, sketching, and animation-based sketching combined with peer-feedback sessions might create exploratory approaches for students developing communication design in higher education. Thus, the study was central to developing the graphic and visual facilitation practices targeting the students' design exploration in higher education. Furthermore, methodologically, this paper presents a long-term perspective on how the collaborative design process of DBR was organised and facilitated in our research design team.

Besides presenting the iterative DBR design processes, this design experiment sought to evaluate the use of the visual methods by focusing on the *assessment* of designerly and creative ways of working in higher education. This was investigated from participants' perspectives, including observations of students' final exams and a follow-up interview with one of the examiners.

THE PROCESS FROM TEACHING TO ASSESSING STUDENTS' DESIGNERLY AND CREATIVE WAYS OF WORKING IN HIGHER EDUCATION

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Abstract

This study investigates how the use of visual facilitation, sketching, and animation-based sketching combined with peer-feedback sessions can create exploratory approaches for students developing communication design in Higher Education. Firstly, the paper gives an introduction to the development of educational design revolving these iterative visual approaches. Secondly, the paper analyses the students' production and utilization of these design- and creative methods. Furthermore, assessment and evaluation of the students' use of these methods in Higher Education is analysed and discussed. The empirical data consists of fieldwork conducted during a 10 ECTS credit course titled 'Communication Design: Experiences, Time, and Space'. The course is part of the bachelor's degree in Communication and Digital Media within Humanities at Aalborg University, Denmark. Thus, the students were not especially trained in using drawing and sketching as academic tools prior to this course. The purpose of the study was to explore how to establish space for joint design inquiry among students by introducing visual methods as tools for enhancing idea generation and group dialogues. The students' challenge was to contribute to the international art center, Copenhagen Contemporary, and help the museum achieve the goal of making their exhibition, 'Heirloom' by Larissa Sansour based on her Palestinian upbringing, more accessible to visitors. Students' suggestions included audio-visual installations and props supporting visitors' dialogues and reflections after attending the exhibition. Based on qualitative empirical data conducted from the teaching and exam situations, findings showed how the students' production and utilization of iterative design- and visual methods enhanced their understanding of artist Larissa Sansour's pieces in 'Heirloom'. At first, the artist's addressing the current political Israeli-Palestinian conflict as well as universally human issues such as identity work and sense of belonging, was abstruse and difficult for the students to grasp. However, by working with visual methods through different design phases, the students were able to reflect, discuss and express central elements from the exhibition in their communication designs. The analysis of students' final examinations showed that the student groups had different approaches to utilization of visual materials in the exam situation identified as the limited-, the hesitant- and the confident approach. Thus, the examiners and teachers had an important role of acknowledging and supporting the students' use of visual materials in the exam situations. When included in the dialogues, the students' visual materializations of their design processes and ideas created a joint reference point for further methodological discussion between students and examiners. Based on the findings, the paper ends by outlining different suggestions for redesign of final examination to support the students' use of visual materials in exam situations.

Keywords: visual facilitation, sketching, animation-based sketching, teaching, learning, creativity, assessment, higher education, Humanities.

1 INTRODUCTION

During the recent decades, a larger focus on visual culture have emerged [1] challenging the traditionally privilege of written and oral language in education [2]. Professor in Media, Culture and Communication, Nicholas Mirzoeff [1] emphasises that the concept of 'visual culture reminds us that there is no such thing as a visual medium because all media are necessarily mixed' (p.1). Furthermore, Mirzoeff describe how we live in a world saturated with screens, images and objects all demanding our attention. Other researchers argue that individuals need to develop competencies in both designing visual languages for others to understand, as well as learning to interpret visual texts created by others [2]. Thus, it can be argued that students in Higher education need to develop skills in order to participate as both designer and observer of the mixed media of visual culture.

Current research in Higher Education advocate for holistic and creative approaches as these are highlighted as transformational and can create conditions in which each student can thrive [3]. However,

creativity is often misunderstood as an expression of artistic talent that is only carried out by especially talented people (e.g. [4], [5]). On contrary, Professor in Creativity, Lene Tanggaard [6] argues that creativity is a craft that we can learn and that what is perceived as new and creative work can differ from domain to domain. Tanggaard [6] emphasises that creativity in education: 'requires that students are taught to share perspectives, to get things done, to take risks, to not always ask for permission and to understand the roles of others in relation to their own creativity' (p. 12). Brinkmann and Tanggaard [4] argue that there is a need for establishment of 'creative communities' in education focusing on the epistemology of the hand. Thus, the researchers emphasise craftsmanship and pragmatic inquiry processes of 'grasping' the world through our hands. This approach is opposite to a more traditionally understanding of learning based on the epistemology of the eye where students solely are being represented to knowledge in lectures by omniscient teachers. Based on the epistemology of the hand, learning through practical activities and experimentation is emphasised and related to John Dewey's pragmatic approach to inquiry [4]. Dewey [7] argue against the traditional separation of theory and practice, emphasising that the: 'so-called separation of theory and practice means in fact the separation of two kinds of practice' (p. 69). Thus, the process of inquiry is located as the central approach to testing ideas and actions that produce reflections about solutions. In a pragmatic approach to learning, theories and methods are seen as 'tools' to apply and reflect on in relation to practical experiences in the world [4]. As there is a movement towards the use of creative approaches in higher education, there is also an tendency for introducing more designerly ways of working in education which also relay on pragmatic perspectives (e.g. [8], [9]). Thus, students are encouraged to take the role of designers when working on student projects [10]. Hansen and Dalsgaard [8] emphasise that when design practices enter new interdisciplinary domains, there is also a need for adapting concrete design methods in these domains. Visual facilitation is an example of how the organisational domain has adapted practices known from the design- and architect field [11] where drawings are used as idea generation and representational tools supporting group dialogues [12]. The practice of visual facilitation is expanding globally in organisations [13] and is also emerging in the educational domain [14]. However, there is a lack of empirical research also relating the field to e.g. pragmatic inquiry approaches within the design domain [15]. Thus, this study aims to show how visual facilitation combined with other concrete design methods such as visual ethnography, sketching and animation-based sketching was explored as a way to establish a space for joint inquiry among students in the domain of communication designs.

When students are introduced to design practices in higher education there is also a need for teachers to act as designers of teaching. However, there is little research on how teachers in higher education engage in design processes and further studies are suggested [16]. In line with this argument, the paper gives an introduction to the development of educational design stating teachers as role models when introducing designerly and creative ways of working in higher education (e.g. [6], [14]). Even though there is initiatives towards creative non-profit activities in education [17] most of the Western world are currently concerned with what can be tested, measured and made accountable for [6]. Furthermore, studies in higher education argue that students can fear to show creative processes in tasks, discussions and assessments, because they are not used to these processes being taught nor measured at the universities [5]. Even though, creative processes are characterized as difficult to observe [6], this study aim to analyse and discuss how students' creative work as communication designers can be assessed exemplified in observations of six student groups' final examinations.

In summary, the research question of this paper is as follow: How can we teach and assess students' designerly and creative ways of working in higher education?

2 METHODOLOGY

The study built on a Design Based Research approach (hereafter DBR) which focusing on both understanding and developing learning contexts [18]. DBR is based on iterative pragmatic perspectives where researchers design and redesign pedagogical interventions, testing these in natural teaching settings [19]. The iterative design of these interventions is a key feature of the knowledge production and results of a research project [20]. DBR projects revolves around different research phases which in the following will be described and contextualized in relation to the development of the pedagogical intervention of this study.

2.1 The twofold function of Design Based Research

Researchers [21] suggests four different phases when doing DBR projects; *Context*, *Lab*, *Intervention* and *Reflection* (p. 10-11). These phases are overlapping, but address different central aspects of the research process:

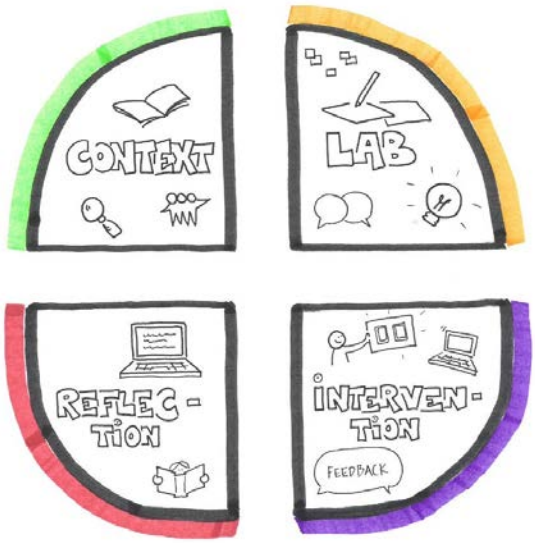

Figure 1. Model of Design-based research phases – Illustration inspired by Christensen et al. (2012, p. 11)

Below the research phases are briefly described:

- **Context phase:** Domain research e.g. through desk research, fieldwork and literature review
- **Lab phase:** Development of an intervention e.g. through design framework and prototyping
- **Intervention phase:** Test of an intervention in practice involving analysis and redesign in iterative processes
- **Reflection phase:** Documentation of results, theory generation and reporting

In this study, the four phases are regarded as the overall research approach to the development of a pedagogical intervention targeted a 10 ECTS credit course titled 'Communication Design: Experiences, Time, and Space'. Besides function as an overall approach to the present study, the DBR model was introduced as way for the students to work designerly when developing their communication designs.

Figure 2. Introduction of the Design Based Research model to students as a way of working with developing a communication designs

Thus, the DBR approach had a twofold function both as a research approach to the pedagogical intervention and as a teaching frame in the course prompting the students to work as communication designers. In the rest of the methodology section, I will address DBR perspectives in relation to the overall research approach of how this study was conducted. In the theoretical and analytical sections, I will return to the use of the model as a teaching frame, describing and analysing the way learning

activities and design methods were related to the students' work in the four different design phases throughout the course.

2.2 The context of the pedagogical intervention

As a central part of Design Based Research, it is crucial to examine the *context* in order to targeting interventions [20]. DBR-researchers emphasise that *context matters* which advocate for a rich description of the natural settings where an educational design is being investigated [18]. Thus, in the following the context and iterative design of the pedagogical intervention of this study is described.

The context of the study was an 10 ECTS credit course titled 'Communication Design: Experiences, Time, and Space' held in 2019. The course was part of the bachelor's degree in Communication and Digital Media within Humanities at Aalborg University, Denmark. Thus, the students were not especially trained in using visual ethnography, visual facilitation, sketching and animation-based sketching methods as academic tools prior to this course. The students' challenge was to contribute to the international art center, Copenhagen Contemporary (CC), and help the museum achieve the goal of making their exhibition, 'Heirloom' by Larissa Sansour based on her Palestinian upbringing, more accessible to visitors. The exhibition Heirloom consists of Sansour's evocative dark science fiction film trilogy 'In Vitro' and the large-scale sculpture 'Monument for Lost Time'. Sansour applies an interdisciplinary approach to her works comprising poetic and sensuous film, photography, installation, and sculpture, often taking a point of departure in a science fiction universe, addressing both current political and universally human issues relating to identity and belonging [22].

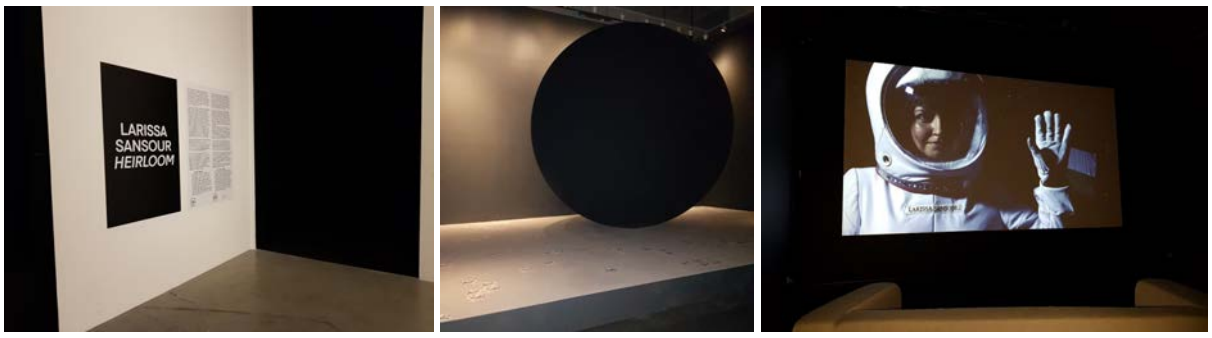

Figure 3. Photos from the exhibition, 'Heirloom' by Larissa Sansour, left: entrance to the exhibition, middle: The 'Monument of Lost Time', right: screen shot from one of the film in 'In Vitro' (Photos provided by the author)

Framing of the design students' challenge where developed as a collaboration between three teachers from Aalborg University and the CC Studio which is the learning center of Copenhagen Contemporary. Thus, the task for the students was negotiated between the teachers and the art center so that it fulfilled both the learning goals of the course, but also had a relevance for current challenges faced by the art center. In this way, the intervention was carried out in collaboration with practitioners which is also described as a central aspect of DBR projects (see e.g. [23].).

The students worked in groups of 4-5 persons and after working 8 weeks with the challenge, the student groups' design suggestions included audio-visual installations and props supporting visitors' dialogues and reflections after attending the Heirloom exhibition. Before the final examination, the students presented their design solutions at CC were both teachers, employees at CC, families and friends were invited. This exhibition (hereafter student exhibition) were also viewed as an intervention where students could receive feedback on their design solutions reflecting on these in their final exams.

2.3 Prior iterations before the pedagogical intervention

A Design Based Research approach to educational design requires a dynamically design and redesign of iterations (e.g. [18], [20]). However, a recent meta-study of DBR reports that examples of iterations *before* an intervention is implemented is seldom reported. Thus, the iteration term in DBR projects seem to be confused with the intervention term or deliberately understood as having similar meanings [23]. In order to be transparent of the methodological approach, I will elaborate on how the intervention of this study can be seen as a part of an iterative process of developing the specific 10 ECTS credit course.

The course titled 'Communication Design: Experiences, Time, and Space' has been conducted since 2012 and the author of this paper has been part of the teacher team since 2015 and was invited to the

course with a specific focus on teaching practical tools such a sketching and visual facilitation related to the students' task of developing communication designs. Moreover, relating the practical tools to pragmatic inquiry approaches, sketching theory, and the overall context of the course. Each year different museums placed in Denmark has been collaborating external stakeholders, providing the context for the course. As students are asked to adopt the role of communication designers, we also consider our role as educators to be designers of teaching [10] when doing educational research [18]. Therefore, each year we evaluate the course and adjust the course in relation to students' evaluations and well as our own teaching observations. A previous study of the course [9] has especially explored the three different inquiry approaches that students are introduced to at the course such as Reflective design practice [24], Design Based Research [18], and Critical design [25]. The study [9] emphasises how these approaches represent different design modes respectively *process, research and politics* (p. 453) and also suggests a fourth meta-mode of inquiry, in which the students select, reflect, combine and wonder within the three modes as part of the design processes. The study aims at providing a theoretical framework to strengthen and nuance pragmatic inquiry processes when applied in university teaching. The present study built on the same pragmatic approach, but will go more in depth with how the teaching of concrete practical tools can facilitate students' design processes through different visual materials. Furthermore, there will be an analysis and discussion on how these design processes and visual materials are enacted and reflected in the students' final exams.

As mentioned, I have been teaching the course since 2015 and each year smaller or larger redesign have been made concerning the introduction of sketching and visual facilitation as practical tools for the students to engage in during their design processes. The introduction of visual tools is placed in the Lab phase of the DBR model [21] where the students work with idea generation, design framework and prototyping as preparation for a later testing of their design solution in the intervention phase. In earlier years, the pedagogical intervention in the lab phase typically consisted of a focus on sketching and visual facilitation (see also description of a similar pedagogical intervention with another student group in [26]). In the course held in 2019, the redesign of the pedagogical intervention was made including animation-based sketching as a way to bring e.g. the temporal and narrative aspect into design processes [27] when students created 1-2 minutes presentation videos of their design solutions. This redesign of introducing animation-based sketching was based on prior teaching experiences in the teacher team [28] where we had explored how art students' video productions expanded the time frame of the students' design ideas in addition to their more static sketches and photos. Here the video productions supported the joint inquiry processes and feedback sessions when students' presented their design ideas. Thus, in 2019, I redesigned the pedagogical intervention with the aim of exploring the combination of sketching, visual facilitation and animation-based sketching when communication students work designerly. The redesign of the pedagogical intervention completed in 2019 including animation-based sketching will be further elaborated in the analysis. Likewise, the practical arrangement of the teaching, e.g. the teacher's use of document camera introducing drawing exercises and the students' use of mobile design walls, will be analysed in relation to didactical considerations.

2.4 Empirical data

Thirty students attended the course in 2019, and the data used for analysis contains teaching observations, students' visual productions such as sketches, presentation drawings and videos, and observation of six student group examinations and students' oral evaluation after finalizing the course. Moreover, one interview with one of the teachers/examiners was conducted. Throughout the course, we as a teacher team conducted written observations that we shared with each other continuously aligning our teaching throughout the course. Furthermore, I used drawings [29] as a way to capture my teaching observations. Different ethical considerations have been made when both collecting empirical data and presenting the findings in this paper. Thus, I have gained permission and consent from the students and examiners to observe the six student groups' final exams [30] with an explicit focus on investigating the assessment procedure of courses that are design oriented. Thus, the focus was on the role of visual materials in the exam situation and not on the students' individual performances. In the exam situations, I sat in the back of the room, taking hand written notes avoiding noises from the computer keyboard. Another ethical consideration arranged in collaboration with the examiners, was that I only did observations on the public part of the examination and left the room under voting and feedback to the students after examinations. Photos of students' project in the paper, has kindly been approved by two student groups for teaching and research purposes. To address my own initial analysis of the final exams, I selected different situations from the observations that I discussed with one of the examiners in a follow up interview. The aim was to make the examiner illuminate considerations in relation to some concrete examples from the exam situations as well as gain insights into overall reflections on how the

examiner perceive the use of visual materials in design oriented exams. In the follow-up interviews with the examiner, I have gained consent to record the interview and use quotations in the analysis of the students' examinations.

Due to the limited data foundation, the purpose of this paper is not to make generalisations about the use of visual facilitation, sketching and animation-based sketching, but to investigate the possible connection between these methods and creative and designerly learning environments in higher education.

3 THEORETICAL PERSPECTIVE: CREATIVE LEARNING IN HIGHER EDUCATION

Tanggaard [6] argues that the creative capacity must be taught and cultivated in education. Furthermore, Tanggaard emphasise that 'the creative capacity concerns the ability to imagine the perspective of another person and thus put oneself in their shoes and understanding, for example, the culturally diverse perspectives of others' (p. 9). In this study, the students were encouraged to take the role as designers of communication designs bridging the artist's work and the visitors' experiences and reflections on the exhibition. In relation to the challenge presented by the art center CC, it can be argued that the artist Larissa Sansour's Palestinian background represents a perspective of another person that is different from the Danish students' background. To fulfill the task of making the exhibition more accessible to visitors, the students were required to 'put themselves in the artist's shoes and understanding' to grasp some of the culturally diverse perspectives represented in the art work. It can be argued that it is not possible to completely access the perspectives of another person, but we can have a positive, open and curious attitude towards seeing the world from other perspectives than our own habitual ways of meeting the world [31]. Researchers within Higher Education argue that representation of knowledge in different modalities, e.g. drawing, animation and videos, forces learners into new ways of thinking, seeing and communicating [32]. It becomes interesting to see whether the introduction of visual methods in the different design phases can offer students other ways of relating to the complex human issues of identity and belonging addressed by the artist. Before analysing the pedagogical intervention, the theoretical perspectives regarding the visual approaches will be briefly described in relation to the DBR phases [21] where the students work with the different methods.

Context phase - Visual ethnography: The context phase revolves around domain research e.g. through desk research, fieldwork and literature review and here visual ethnography were introduced to the students. Artist-ethnographer, Andrew Causey [21] has combined his work as an anthropologist with his passion for drawing. Causey argue for taking the 'risk of drawing' when doing fieldwork, even though it challenge the traditionally way of conducting fieldwork by writing thick descriptions (e.g. [33]). In this study, the students were encouraged to use drawings as a part of their fieldwork [21] at CC in order to slow the pace down in their observations, be curious, be present, and use all their senses in their observations (p. 19-22).

Lab phase – Visual facilitation and Sketching: The Lab phases revolves around development of an intervention e.g. through design framework and prototyping and here visual facilitation and sketching was introduced to the students. As mentioned, the visual facilitation practice is an example on how the organisational domain has adapted practices known from the design- and architect field [11]. Visual facilitation stems from the concept of graphic facilitation and focuses on the collaborative use of 'visual representations to facilitate interaction in a group of people using structured visual content" [12, p.20] These practices highlight process of product [34] emphasizing the act of developing, reflecting and communicating ideas rather than a focus on aesthetic drawings [35]. However, the practice rely on models and icons that contains familiar representations, e.g. Bigger Pictures' 7 elements [36], to be used for idea generation and dialogue in groups. To connect the visual facilitation practice to the pragmatic inquiry approaches, sketching theories were introduced to the students. In the design field the iterative process of developing things is usually materialized in different sketches which serve both the purpose of externalizing ideas and turning thoughts into public [37]. Schön [24] addresses how the process of sketching can be viewed as a reflective conversation with the situation where the situation 'talks back' (p.79) - a perspective which is further discussed by architect and researcher, Gabriella Goldschmidth [38]. Goldschmidth emphasises how the act of sketching can be viewed as a modulater of problem space where the designers can discover new properties and relations that emerge from the sketch but were not intentionally put there. In this study, the students were introduced to simple icons and elements as a starting point for developing their own visual language [12] suitable for representing their specific design process. Furthermore, they were encouraged to theoretically reflect upon their processes of working designerly with the visual methods.

In visual facilitation it is relevant to distinguish between the use of drawing as a dialogue tool and presentation tool [12]. And in the intervention phase, the students went from using the sketching and drawing activities as dialogue tool in the Lab phase to using the sketches more as a presentation tool.

Intervention phase – animation-based sketching: The intervention phase revolves around test of an intervention in practice involving analysis and redesign in iterative processes. Here the students were introduced to animation-based sketching as a way to present their design solutions in the feedback session with stakeholder, CC and the teachers. Animation-based sketching is an approach to communicate, and explore interactions, and user experiences of design solution that are hard to grasp via traditional means of sketching [27]. Thus, the temporal, material and narrative qualities of animation can expand the use of the sketch. In the study, the animation-based sketching was introduced especially focusing on investigating the potential for the students to use the animation-based sketch [27] as a: 'piece of visual communication which encourages the designer, and other stakeholders to comment, critique and propose interpretations that were not consciously integrated in the sketch by the designer' (p.111-112). Thus, the students were tasked to make a 1-2 minutes presentation video to show in the feedback session. The purpose of this video were twofold as the students were still encouraged to perceive their animation-based sketch as both an ideation and dialogue tool (e.g. [12], [27]).

Reflection phase – documentation and final exams: In DBR projects, the reflection phase concerns documentations based on empirical and theoretical reflections regarding the design process [21]. In the student projects, it also involves documenting the process in a report which lay a foundation for the final examination. In this paper, the final examination is also considered a part of the reflection phase as the exams is related to the learning activities leading up to the exams. The analysis of the students' final exams will be addressed in section 4.2.

4 ANALYSIS AND RESULTS

The analysis will address both the teaching and assessment of students' designerly and creative ways of working in higher education. As mentioned the pedagogical intervention conducted in 2019 is based on prior studies (see [9], [26], [28]) and on the iterative development of the course where we have continuously explored different educational formats and materialities. In the analysis of teaching, I will especially focus on three adjustment of the pedagogical intervention regarding the teacher's use of document camera introducing drawing exercises, the introduction of animation-based sketching and the students' use of design walls. Using DBR research as the teaching frame of the course, the abovementioned teaching and learning activities are especially linked to the Lab and Intervention phases [21]. After analyzing the introduction of visual methods in the teaching, the students' overall approach to utilization of visual materials in the exam situations is analysed and discussed as part of the Reflection phase. Furthermore, empirical examples from the interview with one of the examiners are included. The analysis ends by suggesting different redesign opportunities when assessing designerly and creative ways of working in higher education.

4.1 Teaching designerly and creative ways of working in higher education

In research studies, it is argued that teachers need to be role models when introducing students to creative methods [6]. Goodyear [16] further emphasises how the teacher's framing of tasks is pivotal in relation to students' respond to these tasks. When inviting students to the use of drawings as an academic dialogue tool [26] it is crucial to draw together with the students explicitly framing the drawing tasks and also supporting the feeling of 'we' engaging in a creative community together with the students [4]. In the following three different adjustments of the pedagogical intervention will be analysed in relation to teaching the visual methods to the students.

4.1.1 The teacher's use of document camera introducing drawing exercises

Frank and Madsen [14] express how the teacher's introduction to basic skills within visual facilitation slows down the pace and shows the *process of drawing* for the students to follow. Previous study show how the teacher's introductions of drawing exercises projected on a wide-screen through a document camera and a video conference system were appreciated by students located at different campuses [26]. Even though, the students were located at the same campus in the present study, I decided to explore how the document camera worked in this setting as well. Thus, the drawing exercises were shown from a position relatable to the students working position sitting at tables drawing on paper in

their groups. Thus, the aim was to foster the craftsmanship of drawing with a aim of supporting the creative communities in the groups [4].

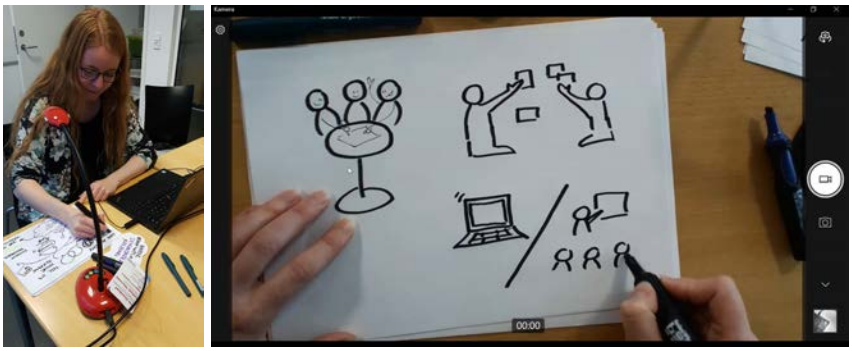

Figure 4. The teacher showing the drawing exercises through a document camera

This present study confirmed the previous findings (see [26]) that the students appreciated the use of document camera as it was: 'good to follow that the teacher was drawing as well'. Likewise, the initial drawing exercises was appreciated as it made the students relax, not getting caught up in an aesthetic focus and adapt a playful approach to the drawing. As one student recalled the introduction: 'Relax and enjoy, we are just playing with materials'. Another student emphasised that it was 'actually really good to get forced into doing the first sketches' as this was an unfamiliar way for them to work at the university. Thus, it can be argued that the introduction of drawing exercises supported the student to take a 'risk' of drawing and being creative when working designerly (e.g. [6], [29]). After the introduction of visual facilitation and sketching, the students were encouraged to develop ideas and develop their own visual language specific for their designs. Furthermore, feedback sessions with peers were organised (see also [26]).

4.1.2 The introduction of animation-based sketching

In the course held in 2019, the redesign of the pedagogical intervention was made including animation-based sketching as a way to bring e.g. temporal and narrative aspect into design processes [27] when students created 1-2 minutes presentation videos of their design solutions. This redesign was especially targeted the feedback session where the students would test their design ideas with stakeholder from CC and teachers prior to the student exhibition at CC where they presented their design solutions. Thus, the two workshops in sketching and visual facilitation was supplemented with a third workshop on animation-based sketching. Inspired by Vistisen's approach to animation-based sketching and practical guidelines [39], I introduced a Stop motion application [40], and Stanscans for the students to produce their animation-based sketch by using their mobile phones (see fig. 6). Moreover, I exemplified how the students could consider the sketching process from the initial ideation phase [37] to presentation drawings [21] to animation-based sketching as ideation and presentation tool [27] (see fig.5). Again, I used the document camera to project the example on a wide-screen in the classroom.

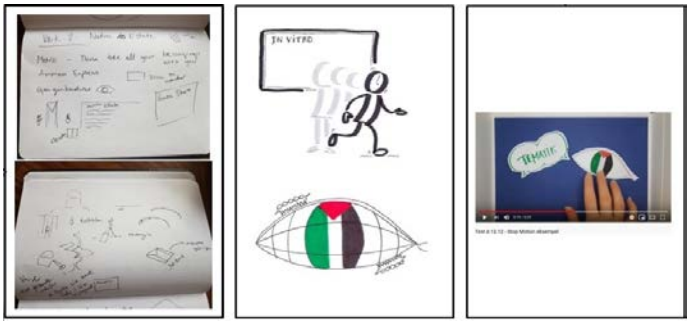

Figure 5. Teacher's presentation of three sketching modes (from left to right) using initial sketches, presentation drawings and animation-based sketches

After the introduction, the students engaged in developing their own animation-based sketches recording a 1-2 minutes film in the stop motion app.

Figure 6. Students' use of animation-based sketching videos: the production of the sketch (left) and a screen dump of a finished presentation video (right)

One student group has explored the materiality of porcelain as this had a central spot in Sansour's art work representing the fragility of your heritage especially if you do not have a place of residence which is the reality of many people due to the political Israeli-Palestinian conflict. In their design, the student group wanted to place the visitors of CC in a situation where they could get a sense of this fragility by letting the visitors both destroy and re-make new porcelain figures by gluing the pieces on a collective composition (see fig. 6 right). In line with Sansour's artwork, the students exploited different questions in relation to the imagined activity at the student exhibition such as: 'Can you create a whole out of fragments?' with the aim of making visitors reflect on how they perceive their own heritage. During the sketching phase, the student group also came up with the name to their design: 'The fragmented state'. It can be argued that in this process, the animation-based sketch functioned as both ideation and dialogue tool [27] when the students discussed how to open reflections on different perspectives for the visitors [6] through both the questions and the title of the design. The student group emphasised that they enjoyed the sketching workshops exploring the different materials and that they found it beneficial to have sketches from the initial phases which could be 'used or redesigned for the stop motion video'.

Due to different circumstances, the representative from CC could not attend the feedback session with students and teachers prior to the students' exhibition. Thus, she was not able to comment, critique and propose interpretations of the design idea [27] that was the main purpose of feedback session. A bit disappointed on not getting feedback from the stakeholder, the students still received feedback on their current design ideas from the teachers where the videos functioned as a point of departure for the feedback. Moreover, the temporal and narrative format of the animation-based sketch made it possible for the representative to view the 1-2 minutes presentation video from each student group and provide written feedback for the students before the student exhibition. Thus, at the student exhibition, she expressed that the videos gave her a relevant insight to the students' design processes before the exhibition. Building on previous studies ([27], [28]), a further investigation on how animation-based sketches can be used in different feedback session formats is suggested, e.g. asynchronously and synchronously, online and f2f formats, etc. At the student exhibition, the abovementioned student group expressed that 'it was a positive experience with the videos, but it was a shame that the videos were not a part of the student exhibition'. The student group did apply some screen dumbs from their video in the presentation of their design solution at the student exhibition, but they might as well have included the video. The students' use of different visual materials in the feedback session and in their final examination is a topic that will be further elaborated in section 4.2. The study will not analyse the students' exhibition in details, but will address examples from the exhibitions in relation to the students' final examinations.

4.1.3 The students' use of design walls

As mentioned in the theoretical section, the iterative process of developing sketches serve both the purpose of externalizing ideas and turning thoughts into public [37]. Thus, we encouraged the collaborative aspect of visual methods (e.g. [12], [41]). Buxton [41] emphasises that a design studio without a place to pin up sketches, clips, photos, etc. 'is as likely to be successful as an empty dance club' (p.153). Thus, the design studio needs to contain a physical place for the design team to visually display their tangible elements from their design processes. In the early iterations of the pedagogical intervention, we as teachers were mostly concerned with a place for the students to show their final design solutions e.g. at the student exhibition at the museum. In the intervention in 2018, we made a redesign and organised for each student group to have a specific wall section in the classroom targeted

collection of their design elements [42]. Thus, the focus on the process [34] was more physically acknowledged in the course. In the intervention in 2019, we wanted to add mobility to the design studio and gave each student group a double-sided pinboard on wheels (see examples in fig. 8 and 9). All the student groups used the double-sided pinboard during the 8 week course collecting and displaying their different design elements. One student group reflected on how the have appreciated the displayed sketches and photos at their pinboard (hereafter design wall): 'We have had the possibility to revisit materials and reconsider design decisions'. Thus, the students seemed satisfied with the use of the design wall during their design processes. Moreover, the mobility of the design wall also made it possible for the students to bring the wall into the final examination which will be further analysed in the next section.

4.2 Assessing designerly and creative ways of working in higher education

As preparation for the final examination, the students were asked to bring all visual materials including prototypes, initial sketches, photos from the exhibition, etc. Thus, it was evident for the students to bring their design walls as part of the examination. Each group were prompted to tell about their design solution connected to the design challenges of making the exhibition, 'Heirloom' by Larissa Sansour more accessible to visitors. Furthermore, each student had five minutes presentation of a self-chosen aspect of their design process, before they went into a dialogue with the examiners. As the study of the final examination focuses on the investigation of the assessment procedure of courses that are design oriented and the role of visual materials, I will firstly analyse students' different approaches to the utilizations of visual materials in the exam situation.

4.2.1 The role of visual materials in the exam situations

Overall, there were different approaches to which materials the students brought along in the exam situations and how the materials were included in the dialogue. All student groups has brought a redesign based on the knowledge they have gained in the final intervention phase when testing their design idea at the student exhibition at CC. It can be argued that this redesign represented the final *product* in project as this was the last scheduled iteration before the examination. In addition to the redesigns, the student groups had different approaches to how much of the other visual materials such as initial sketches, photos from the exhibition, they had brought along in the exam situations. It can be argued that these materials represented different parts of the design *process* leading to the final product. The students' different approaches to utilization of visual materials in the exam situations are analysed and identified as *the limited*-, *the hesitant*- and *the confident approach*. These are illustrated in a model (see fig. 5) and will be further elaborated in the section below.

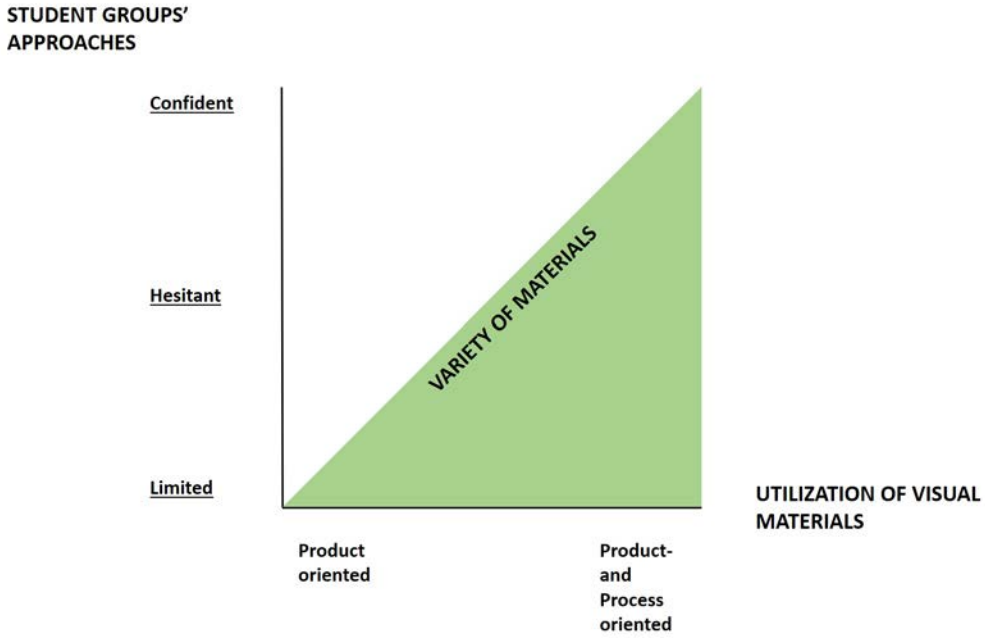

Figure 7. Model illustrating the student groups' approaches to the utilization of visual materials in the exam situations

✦ *The limited approach*

This approach is characterized by groups who had brought the final redesign, but not other visual materials they have worked with during the course. In order to scaffold the students' reflections over the process leading up to the final product, the examiners posed questions regarding the students' choices in the design process, e.g. 'Interesting idea, can you elaborate on why these elements where chosen among others?'. Likewise, there were examples where the examiners opened the students' final report and showed some sketches from here, asking a student group whether they could elaborate on how the act of sketching had influenced their design processes and final product. The student groups had different relevant reflections regarding their design process and had also chosen to insert photos of their sketches in their final report indicating that they found them relevant for their project. However, they did not bring visual materials representing the design *process* nor initiated the dialogue about the process themselves.

✦ *The hesitant approach*

In the hesitant approach the student groups have – besides their redesign – also brought different visual materials such as early sketches, prior design ideas and photos from interventions. However, the hesitant approach began to show before entering the examination room regarding whether to bring the visual materials or not. For example in one group, there was an intern discussion where a group member posed the question: 'Should we bring the sketches?' and another group member answered: 'I do not refer to them in my presentation'. The group decided to bring the visual materials into the examination room, but they started laying them on the floor out of sight for the examiners. In the dialogue after the students' presentation, one of the group members brought an affinity map into the conversation when the examiner asked the student group to reflect on their design processes. Later in the conversation, another group member was reaching for the floor after the sketches, but hesitated in bringing the sketches to the table. After a couple of minutes, where the other group members steered the conversation, the examiner explicitly turned to the student reaching to the floor asking: 'You are about to find something?'. Directly asked, the student felt confident in bringing the sketches to the table and the materials were brought into the dialogue.

Another student group were in doubt whether they should bring their mobile design wall into the examination as a supplement to their final redesign. Directed at me, they asked: 'We are in doubt whether we should bring this design wall, did the other student groups bring their walls?'. As an observer of the examinations, I prioritised a neutral (and honest) answer telling that 'The other student groups have done different things, some have brought the design wall others have not' suggesting the student group to do and bring what they have prepared to do. The student group decided to bring their mobile design wall, but they did not refer to the wall during the examination. Leaving the room after the examination, one of the group member ascertained: 'Well, it was really good that we brought this wall along…' in a sarcastic tone indicating that it was not used during the examination. Another group member replied with a smile: 'Yes, I pointed to the wall once'. Even though, the student group only in a very limited way referred the design wall during the examination, they initiated the dialogue about how they have used the sketching activities as a beneficial tool for their pragmatic inquiry processes.

✦ *The confident approach*

In the confident approach the student groups had – besides their redesign – also brought different visual materials such as early sketches, prior design ideas and photos from interventions. Thus, the groups had brought similar materials as the groups in the hesitant approach. However, in the confident approach, the student groups actively referred to the visual materials along the examination, exemplified in pointing to the design walls and turning the design walls around showing materials on both sides. Furthermore, they anchored their methodological use of theories to concrete material work. Some groups also rearranged the exam room adding a table to the prepared table setting, creating space for their different visual materials. In the confident approach, the student groups explicitly showed how they have used and reused different design activities presented in the Lab phase such as sketching and affinity mapping later on in the process after gaining new knowledge in the intervention phase.

Figure 8. An extract of one student groups' design wall showing their sketches made prior and during the student exhibition at CC

In the confident approach, the student groups were typically at the forefront of the examiners' questions regarding reflections on their design processes initiating these dialogues themselves. As the examiner stated in one of the exams: 'That was also going to be my next question' indicating that it was relevant for the students talk about their reflections and materials regarding their design process.

✦ *Discussion on the three different approaches*

All student groups passed the course and it can be argued that all the three student approaches fulfilled the criteria of the course by designing a solution to help Copenhagen Contemporary make Sansour's exhibition 'Heirloom' more accessible to visitors. The different student approaches should not be understood as closed categories, but as a continuum where the approach can be identified as primarily product oriented (the limited approach) to more process and product oriented approach (the confident approach) and with the hesitant approach in between the two approaches. Even though all student groups were asked to bring all visual materials including prototypes, initial sketches, photos from the exhibition, etc. from their design processes, they might be unfamiliar with showing creative inquiry processes in the exams situations, because they are not used to these processes being taught nor measured at the universities [5]. As one of the examiners argued: 'It is these types of experiences that the students with good reason do not have a language for, because they are not usually taught in these inquiry approaches'. As Tanggaard emphasises [6] creativity in education requires students being taught e.g. to take risks and not always ask for permission. It can be argued that the students from the confident approach were 'taken the risk' of following the teachers' guidance of bringing different visual materials and explicitly including them in their presentations and dialogues even though these ways of organising the exams are unfamiliar to them. As the findings showed, the examiner took an encouraging role in scaffolding a process that supported the students from the limited and hesitant approaches to bring their sketches into the dialogue. Directly asked, the examiner reflected on the concrete situation where a student hesitant reached for the sketches placed on the floor: 'Yes, I remember that the group had a whole arsenal below the table that they did not really dare to bring forward (…) I noticed that the group needed the materials in relation to the dialogue we had, but as the group did not bring it forward themselves, I asked directly, because I found it meaningful in the situation'. It can be argued, that the examiner through the question acknowledged the use of the visual materials supporting the students to shift perspectives on what was allowed 'to bring forward' in the exam situation.

During the development of the course from 2012 and forward, the examiner (and teacher) of the course have continuously advocated for the important role of the different materials in the course 'as these provide the students with concrete opportunities to express their design ideas and solutions'. The examiner emphasised that:

> *'When students bring materials into the examination room, it provides an opportunity for me to ask some questions and gain insights into their design processes that would otherwise be invisible to me as an examiner. The visual materials becomes objects that makes it possible to go into dialogue around the phenomenon of 'inquiry'. They give a more profound understanding of the way, the students have negotiated through the materials (…) Often the present of materials in the exam situations can trigger students' memory and then they can refer to them'.*

Thus, the materials becomes joint reference points for the examiners and the students to explore the different aspects of the students' inquiry processes and for students to revisit their negotiations of design

decisions. Despite the potentials of the visual materials being present in the exam situations, the examiner also emphasised that: 'regardless of which kind of empirical data and theories, the students use in the exam situations, it all depends on how they relate them to their reasoning, consequently how they have made decisions and how their design is related to the context. As argued in the DBR approach [18], the examiner emphasises that context matter. Thus, it was valued that the design elements were investigated in relation to CC and visitors interacting with their design solutions. From this perspective, the next section will concentrate on how the students engaged in different perspectives through the use of materials relating these to the context of CC and Sansour's art work.

4.2.2 Students engagement in different perspectives through the use of visual materials

In the exam situation, one student group presented their design solution on how to make Sansour's exhibition more assessable for the visitors of CC. The student group had made a "World map" (with quotation mark intended) where countries were placed differently than usually questioning the position of power globally and also in relation to the current political Israeli-Palestinian conflict addressed by Sansour. In the exam situation, the student group showed how they have constantly questioning their own design ideas through the use of theories and empirical data such as sketching activities and test with users in interventions. In the exam situation, the student group brought their design wall where they presented a poster of their world map including other visual materials they had made during the course posing the question: 'Where do you belong?'.

Figure 9. "The World Map" presented at the student group's design wall

At the student exhibition, the visitors were prompted to place a little flag on the map reflecting on their own identity and sense of belonging, while the students identified these themes raised by Sansour as important for the visitors to engage in. At the exam situation, the student group reflected: 'In the beginning, it was really difficult as a Danish student to relate to Sansour's upbringing. With this design, we hope that we have made the themes from the art work more tangible to grasp' relating their idea to pragmatic approach to knowledge creation [4]. The students further elaborated: 'It can be argued that it is a general issue that one can feel outside in a complex world.' Thus, the students' articulations and design idea can be viewed as an attempt to bridge the universally human issues addressed by Sansour into a more tangible World map for the visitors to enter a dialogue with and around (e.g. [24], [38]). Based on their intervention at the student exhibition, the students have received mixed feedback from visitors, ranging from engagement and humor to provocation, e.g. some visitors got provoked that Sweden was not represented at the "World map". The students further reflected that they: 'Wanted to stir things up and questioning status quo on the position of power in the world', but that they also were aware of striking a balance in the design not being too provocative so it would be perceived 'cynical' by visitors. It can be argued, that the students' dialogue and reflections showed how they managed a creative process of adapting and switching between different perspectives [6] of both the artist and visitors.

Based on the students own experiences with visual approaches, several student groups also included sketches activities in their design solutions making the visitors reflecting on their experiences after experiencing the exhibition Heirloom. Some groups added the sketching activities in their first ideation of a design solution, while others considered their redesign to contain visual methods after user tests in interventions. At the final exam, one student group elaborated the iterative development of their design solution where they had asked visitors to reflect on their own family heritage: 'Our early design solution was very text-based. Based on the interest from children at the student exhibition we wanted to make space for drawings in our design'. Another group member added: 'We also targeted this redesign to adult who might like to draw'. Based on their own experiences in the inquiry processes, the group

emphasised that the act of drawing may open up for visitors' different creative interpretation of Sansour's sci-fi universe in the trilogy 'In Vitro'. The student group emphasised that: 'Drawings "speak" across language and they can break down language barriers'. When the examiner asked a follow up question on why they have maintained writing as an reflection opportunity, the students elaborated that it was relevant with both opportunities because 'for some adults a drawing exercise will be too childish to engage in'. Thus, the students also addressed different perspectives on visitors' engagement in reflective activities, not assuming anyone would prefer drawing activities.

4.2.3 Students' reflections on the use of visual methods as academic practices

The abovementioned examples showed how the students reflected and engaged in different perspectives of the artist and visitors through their visual materialization of design ideas. As Tanggaard [6] emphasises, creativity also concerns how we understand our 'own creativity' when working through pragmatic inquiry processes. As mentioned in the teacher's introduction of drawing exercises, a student emphasised that it was good to 'get forced into doing the first sketches' as these methods were an unfamiliar way for the students to work at the university. At the exam, another student elaborated on the students' roles as communication designers [10] stating that: 'The pragmatic approach break with the academic traditions. My understanding of our academic discipline has been put to the test'. Thus, it can be argued that the student articulates the emerging of designerly approaches in new interdisciplinary domains [8] and that it calls for an adaptive period for the students to familiarize with these ways of working in Higher Education. Prior to the course of the present study, the students had been introduced to pragmatism and design based research at a couple of other courses. However, this was the first course where we as teachers had a more explicit focus on the teaching of practical visual methods for students to work with supporting their inquiry processes. Several students showed appreciation and new acknowledgement of these ways of working in academia with a renewed understanding of the process of inquiry: 'The whole process has really improved our understanding of epistemology, we have had a lot of ideas that we have sharpened through the process of sketching.' Other students expressed: 'It has worked really well with sketching, that we have been able to visualise the process. This literally made the inquiry processes more explicit' and 'It has been fruitful for our understanding of pragmatism that the processes were visualised'.

In the oral evaluation after finalizing the course, some students expressed that the 8 week course 'had been a very long and intense process' suggesting that the introduction of visual approaches was cut down to two workshops as 'there were a lot of other things to pursuit in the course' referring to e.g. domain specific knowledge about art galleries and museums. Likewise, some students wished for more time in between the sketching workshops 'to process these new ways of working' and have more time to prepare for e.g. the animation-based sketching video. Furthermore, in the oral evaluation some students expressed satisfaction with the combination of different visual approaches such as visual sketching, visual facilitation and animation-based sketching as these methods were perceived relevant for their collaborative design processes: 'It was good that we had done some visualisations from the beginning that we could use and reuse in our stop motion videos'. Overall, it can be argued that the students valued the combination of visual approaches to 'grasp', understand and support pragmatic approaches in their design processes. However, these ways of working should be balanced in relation to the overall time frame and other learning goals in courses as well as time for the students to get familiar to these ways of working in Higher education.

4.3 Redesign of the final exam situations

Based on the iterative approach to testing and redesigning pedagogical interventions [18] the result from this study is relevant to consider in relation to next interventions when teaching and assessing students' designerly and creative ways of working in higher education. In this suggestion of redesign, I will especially focus on the assessment and exam situations as these also reflect the teaching and learning activities leading up to the final examination.

In the present course, it can be argued that the introduction of visual approaches such as visual facilitation, sketching, animation-based sketching combined with peer-feedback sessions created exploratory approaches for students developing communication design in Higher Education. Furthermore, the students expressed a greater understanding of the pragmatic inquiry approaches through these ways of working. However, doubt and unclearness of how the visual materials should be used and represented in the students' final examination were identified among some of the student groups. In a meta-perspective, it can be argued that we as educators are designers of teaching (e.g. [10], [16]) and as a continuously development of the course, we do experiments on both teaching and

assessments. As the examiner noted: ‘We are a bit like novices. At design schools, these approaches would just be the naturally way to do things. But because we apply the methods in these settings we have to create a practice that do not exist beforehand. That I found really exiting as well’. It can be argued that even though we have developed and redesigned the pedagogical intervention over a period of years, we are still entering a new world of exploring designerly methods in new interdisciplinary domains [8] such as communication design. Moreover, there seems to be a need for further development of these practices, if we should foster holistic and creative approaches in higher education more broadly [3].

As a part of the development of the course, we as teachers have continuously negotiated our understanding of how we perceive valuable and relevant ways to include visual materials in the teaching and exam situations. However, as the examiner expressed: ’there is still a need for the students to acquire more concepts so that they can discuss and acknowledge these ways of working. And also a need for more methods to exemplifies how they can ascribe meanings to the documentation of their design process, so that they can relate to these in the exam situations’. It can be argued that the better we as teachers become at developing a language to address the value of visual inquiry approaches, the better we can support students doing meta-reflections on their pragmatic design processes [9].

A concrete redesign of the course held in 2019, was the introduction of mobile design walls for students to collectively gather their design elements during the course. The design walls were also considered to be used as a dialogue- and presentation tool [12] during the exam situations. The findings showed, that for some students the design wall was included as a central part of their examination (the confident approach) while for other students the use of the design wall was absent (the limited approach) or the design wall became a passive object in the room (the hesitant approach). In the oral evaluation some students expressed: ’it was great with the design walls, but it would be nice if you would emphasise even more that we should bring documentation of the design processes to the examination’. Other students agreed saying: ‘The walls provided a good point of departure for the talks’. The last student quote also reflects the analysis of the examination, where the visual materials - when included in the dialogues - created a joint reference point for further methodological discussion between students and examiners. Even though, the students explicitly were asked to bring all visual materials including prototypes, initial sketches, photos from the exhibition, etc to the exam situations, it would be relevant to articulate and repeat these guidelines e.g. in the beginning of the course by showing photos from a prior exam situation where the different visual materials were included. Thus, a stronger relation between theory and practice [7] of the exam situations could be emphasised. As the examiner emphasise in the interview, at the beginning of each course, we prioritise to show photos of the different visual approaches and prior student exhibitions supporting the future students’ imagery of the material focus in the course. Based on the findings from this study, it is suggested to add the same approach regarding visual examples of the exam situations.

As teachers we had considered the design wall as an attempt to focus attention on the visual materials. However, a shift in exam location might also foster a process of more inclusion of visual materials in the exam situations. Even though, the exam room was organized with several tables to place the visual materials on, the arrangement still had some limits, cf. when the students from the confident approach rearranged the table settings to fit their visual materials.

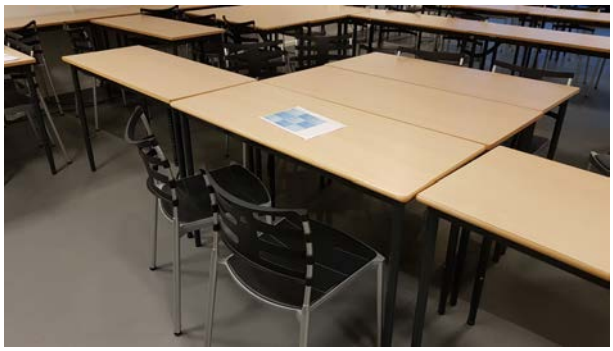

Fig. 10. Photo of the table setting in the examination room

Fig. 10 show the table setting in the exam situation where examiners were placed in front while the student group sat around the three-lined table with visual materials in the middle at the tables and the design wall on the side of the tables. As mentioned in the confident approach, the students stood up

and actively turned the design wall around including these visual materials in the dialogues. Creative practices in education calls for different arrangement of space [43] and it can be argued that despite some table adjustments, the organisation of this exam room might still be associated with how the students are used to attend exams at the university, sitting down in front of examiners presenting theoretical argumentations. As the examiner emphasised: 'The students have some experiences from prior courses where the expectations at the exams were for them to present arguments based on theoretical conceptions. And it is not like, that they do not have do this at our course, because theories can provide good arguments for some things. However, it is also an inquiry into a space of materiality that are of the essence in this course'. At the oral evaluation, the students and teachers/examiners collaboratively ideated on how to rethink the exam situation of the course, e.g. combining the student exhibition at CC and the examination. Thus, it can be argued that they engaged in a creative community [4] of rethinking the exam location. This perspective is suggested to be further investigated e.g. from an authentic assessment approach perceiving assessment as learning [44].

Besides rethinking the exam location and making guidelines even more explicitly, it would be relevant to continuously encourage all students to 'dare' and 'take risks' to foster creative approaches in higher education [6]. In line with the encouragement of making students create their own visual language [12] we as teachers should also be curious and open to students' creative perspectives of introducing new ways of thinking and communicating their design solutions in the exam situation [32].

5 CONCLUSIONS

This aim of this study was to investigate teaching and assessment of students' designerly and creative ways of working in higher education especially focus on Humanities where design approaches slowly emerge. A twofold approach to Design Based Research laid the foundation of the study, placing the teachers as designers of learning environments and students as communication designers developing design solutions targeted the context of the art center, Copenhagen Contemporary. Through different inquiry phases: Context, Lab, Intervention and Reflection, the students were introduced to visual methods such as visual facilitation, sketching and animation-based sketching which supported their joint inquiry processes in groups. Based on qualitative empirical data conducted from the teaching and exam situations, findings showed how the students' production and utilization of iterative design- and visual methods enhanced their understanding of artist Larissa Sansour's pieces in 'Heirloom'. Furthermore, through their visual materialization of design ideas, the students were able to adapt different perspectives of both artist and visitors, bridging the artist's work and the visitors' experiences and reflections on the exhibition.

Based on prior iterations at the course, the analysis of teaching revolved around three main adjustments; the teacher's use of document camera when introducing drawing exercises, the introduction of animation-based sketching and design walls which supported the students' work with visual materials. Findings showed that the teacher being a role model was crucial, drawing together with the students in the beginning of the course and exemplifying exercises for the students to engage in as these visual methods were unfamiliar for the students to work with in a higher educational context. Overall, the students valued the combination of visual approaches to 'grasp', understand and support pragmatic approaches in their design processes, when these approaches are balanced in relation to the time frame and other learning goals at the course.

In the analysis of the final examinations, findings showed that the visual materials became joint reference points for the examiners and the students to explore the different aspects of the students' inquiry processes and for students to revisit their negotiations of design decisions. However, some students were in doubt and unclear about how to include the visual materials of their design processes in the examinations. Findings showed how student groups had different approaches to the utilization of visual materials in the exam situations identified as the limited-, the hesitant- and the confident approach. Thus, the examiners and teachers had an important role of acknowledging and supporting the students' use of visual materials in the exam situations. The different student approaches should not be understood as closed categories, but as a continuum where the approach can be identified from primarily product oriented to both process and product oriented. Thus, it can be used for teachers and examiners as awareness points in order to support students in showing and articulating their design processes in the exam situations. Building on previous studies in higher education [3], none of the student group approaches in this study are identified as lacking creativity. On contrary, the limited and hesitant approaches among students illustrates that the students are not used to an educational system where these ways of showing their work is cultivated nor valued in either classroom or exam situations.

Thus, this study advocate for further development of these practices, if we should foster holistic and creative approaches in higher education more broadly.

To encourage the students' use of visual materials in exam situations, some concrete example of redesign were suggested. As a supplement to oral and written exam guidelines, introduction of visual examples such as photos from previous students' exams are encouraged to support students' imagery of including their visual materials in the final examination. The course in 2019 already included different feedback sessions in the intervention phase; peer feedback, feedback from stakeholders and teachers and students' exhibition for the students to test and receive feedback from visitors on their design solution. Furthermore, an experimentation of exam location and combinations of feedback activities is suggested to strengthen e.g. a more authentic assessment of students' creative and designerly ways of working in higher education.

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Chapter 8: Adventure of thought

Before, I will make the conclusion by 'connecting the lines' between the papers, I will let my mind wonder in a concluding 'adventure of thought' (Badley, 2015) where I take a critical stand to the research results. The research project has shown how humanities students' have appreciated the use of visual methods to support their design exploration in groups. However, as outlined in paper 6, there is also a continuous need for students to acquire a variety of concepts and theories to discuss these approaches in academia. Below, I will reflect on current challenges and possibilities, when working with drawing as an academic dialogue tool. The 'adventure of thought' is based on my visual notes and other empirical data collected through this four-year PhD project.

A few days before I handed in this PhD dissertation, I received the following message from a fellow PhD student and educational researcher, Marika Tervahartiala from Aalto University in Helsinki: *"You've been in my mind as I've been going through my drawings/sketchbooks and scanning them. You've been the only researcher colleague who fully understood the meaning of drawing in research and shared something very dear to me."* I have included this message in this final section with consent from Marika, because I think it points to two important insights. Firstly, that I am not the only one in academia that long to merge my scholarly and artist-self (Leavy, 2020) in the representational forms of drawing, and secondly it also points to a significant focus, which I need to be aware of; that not everyone has this longing and interest in the drawing practice.

When I first entered the EuViz conference 2018, I was excited to experience a community that shared the same interest in drawing as a professional practice, as I did. As my sketchbook and photos from the conference revealed, I felt a sense of resonance at the conference (Rosa, 2019). For example, I was thrilled to notice that both the keynote from Bikablo (https://bikablo.com/en/) and the founder David Sibbet talked about graphic facilitation as a way of *dancing*. Sibbet emphasised: "*We dance while we facilitate, we navigate through our bodies*".

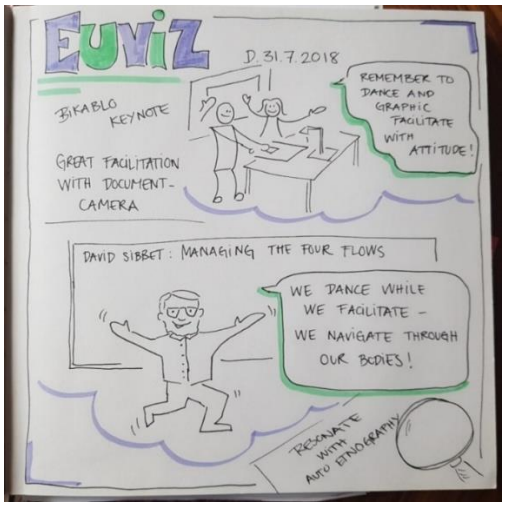

Figure 40: Fieldnote of the connection between visual facilitation and dancing

I have made the same reflection on the connection between drawing, playful approaches, and dancing in a previous blogpost in 2016 (http://www.counterplay.org/playful-space-nice-place/). Thus, it can be argued that these connections between dance and drawing, resonated with my experiences. Not like an echo (Rosa, 2019), but as articulation of some of recognisable experiences, I had relating these bodily movements. At the same time of attending the EuViz conference, I also started reading autoethnographic texts where the bodily experiences where emphasised. For example, as beautifully described by Tami Spry: "*Performing autoethnography provides a space for the emancipation of the voice and the body in academic discourse through breaking the boundaries of stylistic form, by reintroducing the body to the mind in the process of living research"* (Spry, 2001, p. 720). Thus, in my fieldnote, you can also see in my annotation that I have noticed the connection to autoethnography.

After attending the EuViz conference, I signed up for a PhD course in autoethnography in 2019, as I wanted to explore the personal dimension and the connection between the body and mind in academic practice, creating space for the use of drawings in my research. Here I was delighted to meet Marika who shared my interest in drawing as a research approach (cf. the quote in the beginning of this section). In the beginning of the course, we were asked to build our research in LEGO as a part of the presentation round of participants. I found this approach relieving, because – as when I draw – it helped me gather my thoughts on want to communicate (see further reflections from section 5.3). Continuing the course, it became evident that the exercises relied primarily on writing and taken turns in dialogue rounds of sharing. Below is my field note from an exercise at the course, where we were tasked to 1) Write 500 words about our research project, and afterwards 2) Edit a fellow student's written text into a third person viewer. The purpose was for us to experience our research project in the eyes of another researcher.

Figure 41: Fieldnote of writing exercise - from autoethnographic PhD course 1/3

As the fieldnote show, Marika poses the question, whether we can do the exercise in visuals instead. The request is denied from the teacher with the explanation "*that the piece have to be editable*" for a fellow student afterwards. It is interesting to observe the conventional understanding, that text formats are *editable* while drawing formats are not. I also think the example can be related to a discussion of which representational formats do use to present research? (Leavy, 2020) Do we only use visuals in research, when the results are 'final' and not in the explorative phase, when editing is still undergoing? In my fieldnote drawing, you can see that I was wondering about drawing the exercise, but sticked to the written guidelines, where Marika did 'the risk of dare' (Causey, 2017) and drew the exercise despite the initial rejection of this approach from the teacher.

Figure 42: Fieldnote of writing exercise - from autoethnography PhD course 2/3

In the second part of the writing exercise, we shared our productions in pairs (see Figure 42), where Marika and I were sharing our productions. When I saw Marika's drawing of her research project, I got inspired and confident that I would make the edited version of her piece into a drawing as well.

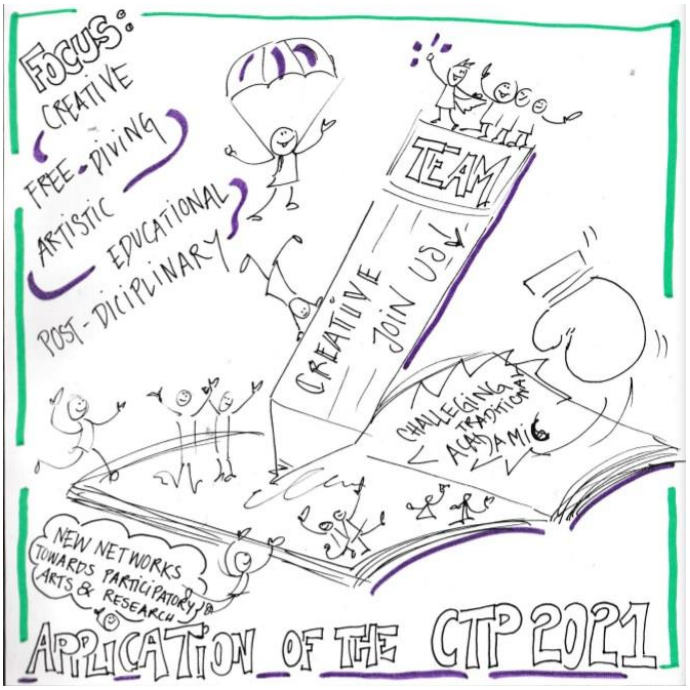

Figure 43: Fieldnote of writing exercise - from autoethnographic PhD course 3/3

Figure 43 shows how I made a drawing of Marika's research as a combination of what she drew herself in the first edition and what she verbally elaborated during our sharing. Thus, I used techniques from the graphic and visual facilitation practice, to extract some essential points from the dialogue (e.g. Sibbet, 2010). Marika was delighted and expressed that "*It was the first time someone has been drawing her research project*". This experience and our dialogues around the visual research throughout the course, probably made her write to me after two years, when going through her sketchbooks.

In the feedback at the course, Marika further expressed that she: "*really liked the boxing glove*" (in Figure 43). In a retrospective, I probably encompasses that symbol and the text "challenging the traditional academic" in the drawing as a comment to the restricted rules about how to handle the *written* exercise. At the EuViz conference in 2018, I made this drawing at the end of the conference, when the conference organisers asked: "*What is your next step*?"

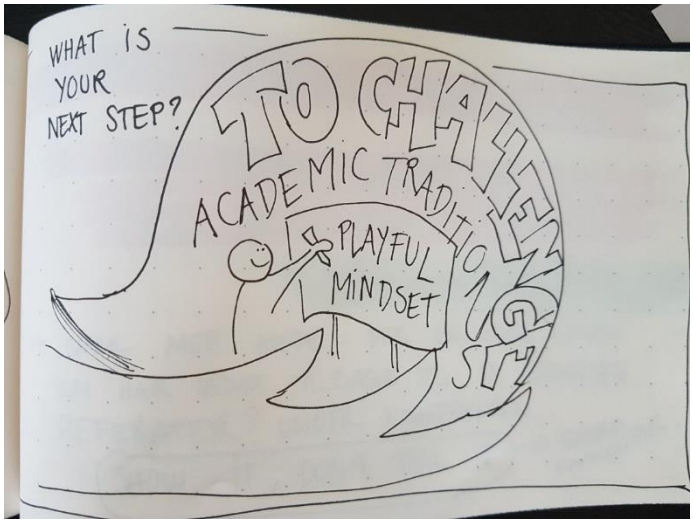

Figure 44: Fieldnote from the EuViz conference 2018

It can be argued that Marika and I shared a similar intention of challenging the academic practice – both in this specific exercise at the autoethnographic course, but also in our choice of research project. The example can point to conventions of the privilege position of written and verbal language in education (Bowen and Evans, 2015; Goodyear, 2015) that still emerges even at a PhD course that was supposed to embrace various bodily and creative ways of conducting research. In all fairness, there were also more performative and creative exercises at the end of the course (and in the beginning with the LEGO exercise) and the teachers were very aware of creating a safe and positive learning environment for us to share our experiences. However, it can be argued that the main activities of the course relied on traditional verbal and written language (Mirzoeff, 2002).

There is no clear recipe on how to perform and write autoethnography (Ellis, Adams & Bochners, 2011) and the previously quoted Tamy Spry (2001) combined poetry with her own experiences and ethnographic perspectives presented by e.g. Clifford Geertz (1973). In ethnographic fieldwork, Geertz is known for his 'thick description' and an emphasis on *written* notes as the acknowledged way to do ethnographic fieldwork (Causey, 2017). As shown throughout this research project, I have explored the use of drawing as a part of my research approach. In his paper: "You Gotta have a Grievance: Locating Heartbreak in Ethnography" (2010b) Van Maanen emphasises that: "*A grievance or sense of righteous*

indignation it seems can get one into the field and keep them there" (Van Maanen, 2010b, p.338). From this perspective, it can be argued that my grievance that keep me interested in the field of graphic and visual facilitation, is the wish to keep challenge the conventional formats in academic practices in line with wishes proposed by other researchers (e.g. Causey, 2017; Leavy, 2020).

However, it is also relevant to question and criticise my own enthusiasm of the particular field, that I am researching (Van Maanen, 2010b). Because not everyone had the same joyful experiences of drawing on the blackboard in elementary school (see the introduction) or feel an appeal towards creative methods as an academic practice. At the PhD course in autoethnography, I also met other approaches to the academic practice besides Marika's, which can be argued to be similar to mine.

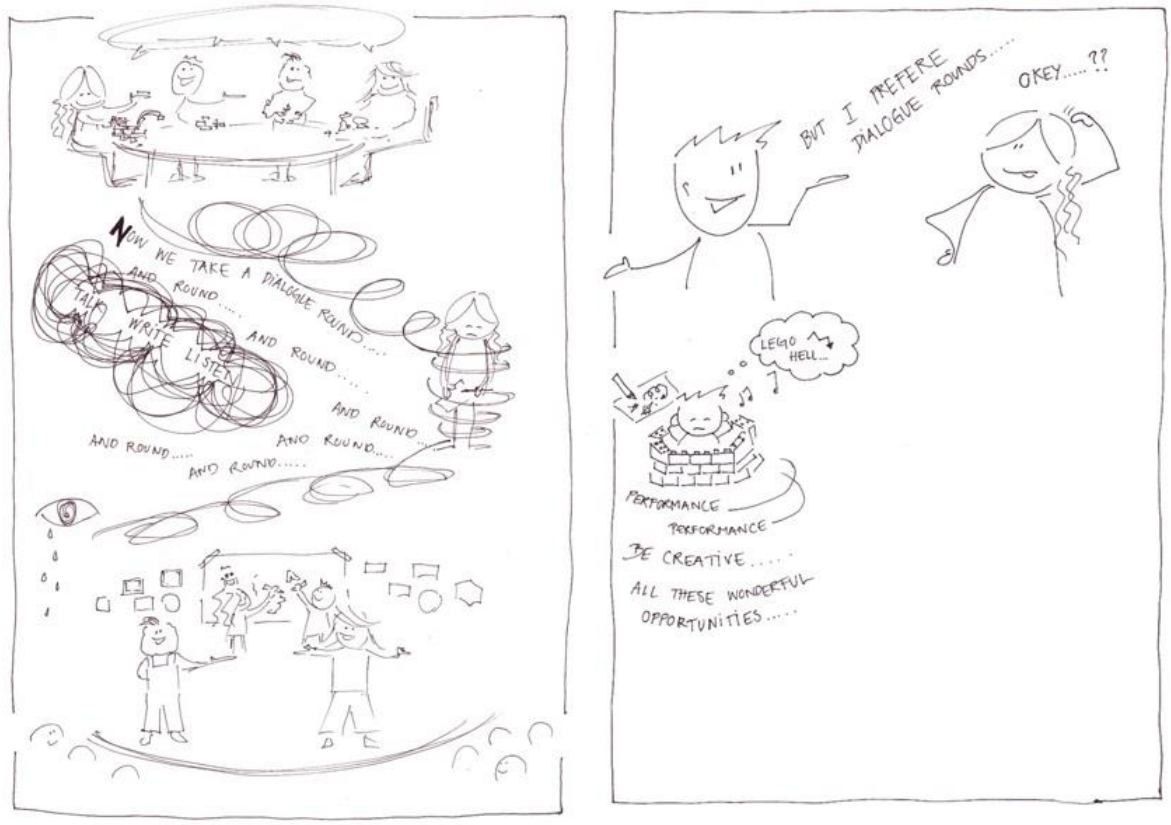

Figure 45: Field note from the autoetnographic PhD course –
my impression of the course (left) and fellow student's expression (right)

Figure 45 shows two different experiences of the activities at the course. On the left, I have illustrated my own experiences; how I was delighted at the first introduction exercise with LEGO bricks and at the final performance, where we were allowed to use different representational formats such as music, dance, drawings, etc. However, throughout the dialogue rounds, I was struggling with my expectation to an autoethnographic course in relation to incorporating body and mind in the exercises (as expressed by Spry, 2001). However, as the drawing on the right showed, I had a dialogue with another fellow PhD student at the course who actually "*preferred the dialogue rounds*" as a way to engage in the research endeavor. He called the introductory presentation round a "LEGO hell", because he did not liked this 'forced expectation' of creative expression. As you can see in my drawing, I was a bit puzzled by this view, as it did not correlate with my own. It can be argued that the exercises that

encouraged my creative mind, was the same that restricted his creative mind and vice versa. This kind of self-observations (Brinkmann, 2012) is also relevant to take into didactical considerations, when I conducted design experiments implementing different visual and creative approaches in the educational designs.

The findings in the design experiments showed an overall engagement from the students, when they adjusted to this unfamiliar way for them to work (Papers 5 and 6). In Paper 4, there were examples of how the autoethnographic approach, and the use of visuals allowed some of the students to find interesting angles of the subject, even though the game theory did not appeal to them. These experiences can also be linked to Paper 3, where the employees expressed how the use of graphic facilitation allowed them to show creative and playful sides of their academic skills. I have other examples of how students continued working with graphic and visual facilitation after attending my workshops, sharing their work with me or asking for possibilities of entering an internship in relation to investigate the method in-depth. It can be argued that these findings could points to the participants' (students and trainees') feeling of resonance towards these ways of working (Rosa, 2019). However, there is also a need to emphasise a couple of nuanced perspectives from the empirical data, because not everyone experienced this immediate appreciation of the creative inquiry processes.

After attending a master course, where we combined different audio-visual methods to support students' design exploration regarding video production used in their own teaching (Ørngreen, Henningsen and Hautopp, 2021), one student emphasised: "*I am not found of the explorative approach to problem framing. I prefer to go directly to problem solving. I also experience that many design approaches relies too much on subjective judgement rather than scientific evidence".* I believe that this student tap into an essential discussion within the use of visual and creative methods in academic practice and also a critical point to be aware of. From a meta-perspective on DBR approaches within educational research, it can be discussed whether 'scientific evidence' is achievable without the subjective involvement of the teachers and researchers. Causey (2017) emphasises the subjectivity, because ethnographers know that there is no way to capture entire cultural worlds in their abundance and in a timely scope (Causey, 2017). You can say that is a relief, but also a concern. Because how do I trust my focus when I am presenting the story of this PhD journey? Do I listen louder when someone speaks my convictions? For example, when the keynotes at the EuViz 2018 conference makes a connection to dance that resonates with my own view on creative practices, or when Marika challenge the written exercise description at the PhD course.

Causey emphasises that: "*Lived experiences with others, when the intent to understand such things as social interactions, can only expose an individual to a modest glimpse of those lives, and only a flicker of that glimpse can be recorded – whether in words, film, sound, or drawing – as documents. Those documents will later be unavoidably partitioned, edited, selected, ignored, forgotten, or lost* (Causey, 2017, p.2). Thus, it can be argued that the writing of this dissertation consists of my 'glimpse' from a four-year research project. As mentioned, some empirical data were foregrounded (Cobb et. al., 2003) and more systematically analysed, while other empirical data functioned as background and can be perceived as my ongoing everyday inquiry (Brinkmann, 2012). I want to extract a few points more, because: drawing is not for everyone or for every purpose in academia. In this research project, I have especially investigated the use of graphic and visual facilitation in relation to students' design exploration in groups. From other empirical data, I have feedback from students ranging that the

methods were an 'eye-opener' for their academic practice to feedback about 'it was too childish to draw at the university'. At a workshop for art teachers, some participants found it refreshing with new ways of doing their craft while some participants felt restricted by the icons and models that graphic and visual facilitation typically rely on.

In an evaluation at a master's programme, where I introduced to the basic elements in graphic and visual facilitation – no matter the students' general attitude to drawing – they mentioned the session as something they remembered. Several expressed their surprise *"it was extremely surprising that we had to draw*". In an interview with two former master's students from an online course which was not specific targeting design exploration, one student emhasised: "*I remember your use of presentation drawings in your PowerPoint presentations. It supported my understanding of the content that you related it to visual representations*". The students referred to the approach as 'an alternative method', which they were not used to at the university. It caught my attention, that they also remembered the concrete cases used in the teaching sessions. For example, I arranged for the students to try out an online platform, which had the purpose of strengthen participants' creativity through different exercises. On the platform there was a high emphasis on how these creative skills were measured, which I considered to be a relevant didactical topic to discuss with the students based on their practice-based experiences (see also discussion about creativity in Paper 6). One of the students expressed: "*It was super provocative, because I was using my time on these exercises on the platform, which did not train my creativity. And I start questioning if it whatsoever could train my creativity*?". As these students worked with the connections between IT and learning, I had chosen this platform to spark a critical discussion about the didactical design and possible redesign of the platform. In the interview, the other student expressed how this exercise challenged her in another way than in usual readings of academic texts: *"I like case-based teaching, because it provide something concrete to relate the theoretical foundation to".* The students' explicit feedback on my use of visual and cases in the teaching, resonates with my own preparation phase, where examples for teaching becomes more evident for me, when I draw connections between the context, cases and theoretical perspectives (see section 5.3).

At the abovementioned online course, we are a teacher-team of three teachers who have developed the course over the last five years and case presentations is a specific focus in the course. In their final projects, the students are tasked to analyse either a digital platform, website, or online learning course in relation to the theoretical perspectives presented at the course. There is also an option of choosing their own specific course and often students choose to analyse my teaching sessions from the course. Some students with a positive approach to the potentials of e.g. the use of presentation drawings and other creative approaches and some students with more critical perspectives on whether these approaches are appropriate to include in higher educational teaching. From the perspective on resonance, it can be argued that my own use of drawings as a part of my preparation phase, enabled me to draw stronger connections between theory and practical examples organised in cases to investigate. As shown in this section and in the papers, the use of drawings in academia are typically surprising for the students in the first place. Thus, it can be argued that there is a possibility of creating spaces of resonance (Rosa, 2019), where the teaching come to concern and affect the students (Fenwick, 2020). For some students the use of drawing as an academic dialogue tool is an approach resonates positively with their relations to academic practices. For other students taken a more critical stand towards the teaching, the approach seems to interfere with their experiences of academic practice. No matter the motive, if we can affect the students to go into a critical inquiry of the cases

and teaching presented in higher education and create a space, where they 'dare to' present their visual inquiries and critique; I think we have succeeded in encouraging them to draw their own connections in relation to the different tools, theories and empirical cases presented in higher educational teaching.

As the nuanced perspectives in this section showed, not all students will find the graphic and visual facilitation methods beneficial for the design explorations in a long-term perspective. Senior in Didactic Science, Steffan Selander (2022) shares how his crafts and design in glassmaking, made him rediscover his engagement in academic writing. I will argue that my engagement in graphic and visual facilitation has enlivened my academic practice and writing. The point to be made is that we all have different experiences that influence which spaces of resonant relationship that will occur in our meeting with the world (Rosa, 2019). For some the act of drawing or the act of glassmaking will create resonance, for others it might be music, dance, theatre, or an engaging dialogue. By introducing drawing as an academic dialogue tool in higher education the aim is not to suggest this as a single approach to academic practice. However, the aim is to strengthen the acknowledgement of visual methods to supplement the traditional verbal and written language in education (Bowen and Evans, 2015). Thus, this research project aimed at providing spaces for the students to engage in critical inquiry testing and discussing these methods through their design explorations.

8.1. The Drawing Connection Model

As mentioned, I see myself as a traveler going into the field of graphic and visual facilitation and connecting my own experiences to the experiences of others. Throughout this research project, I have investigated the use of the methods in organisational and higher educational context reflecting the methods in relation to the empirical data and theories. As described in section 1.8., I have used the metaphor of inviting theories into 'a dialogue around a design table' with an aim of discovering connections to other research fields and to strengthen the establishment of graphic and visual facilitation as a research field. I had a specific focus on drawing connections between the organisational and higher educational contexts, where I from the twofold function of DBR have positioned the students as designers and researchers going into critical inquiries as part of their humanities education. Thus, I have argued how we as higher educational teachers take the role as designers and go into a joint inquiry together with the students.

As described in section 3.2. *The connection between academic drawing and academic writing*, I think that we should explicitly applaud the 'talent for bricolage', when working with knowledge building in academia. As mentioned, this way of working resonates with an understanding within graphic and visual facilitation, where you are listening for the essence of a group's ideas (Sibbet, 2010) making these visible on the paper (Agerbeck, 2012). From a pragmatic perspective, we should explicitly address how our knowledge creation is both depending on our practical experiences, crafted through our hands (Brinkmann and Tanggaard, 2013) and our theoretical reflections that connect our personal experiences to a more general understanding of social phenomenon in society (Brinkmann, 2012). Throughout this research project, I have shown how I have explored the act of drawing in different phases of the research; doing fieldwork and analysis, and presentation of research and the production of writing. Furthermore, I have discussed how the perspectives of resonance (Rosa, 2019; Fenwick, 2020) can be related to this way of working in higher education. Thus, I will summarize a contribution of this research project in "The Drawing Connections model":

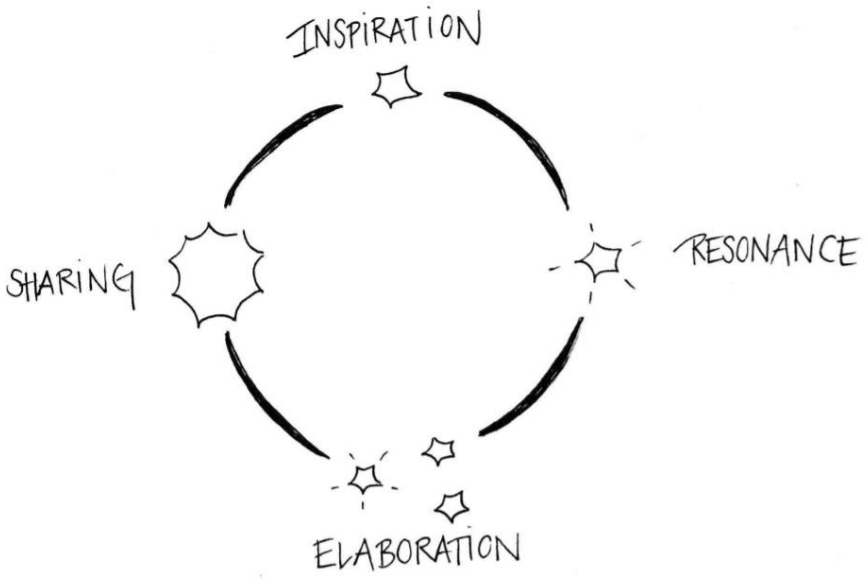

Figure 46: The Drawing Connections Model

The Drawing Connections Model is a way to encompass an abductive approach to reasoning, while at the same time acknowledging the extensive multimodal information sources available in modern society (Mirzoeff, 2002). Likewise, the purpose is to provide a language for illuminating and describing design exploration and design decisions in academia, which often relies on negotiating reality (Frayling, 1993) through different materials (e.g. Goldschmidt, 2003) rather than making decisions based on rationality and logical thinking alone (Nussbaum, 2016).

Below I will address the four phases in relation to an example of reading an academic text. However, the 'inspiration' could take a point of departure in other kinds of experiences incorporating a variety of media and materials.

INSPIRATION: How I get inspired when reading an academic text depends on how the author succeed in making suggestive 'hooks' and engaging case examples. Similar to the work of graphic and visual facilitation, where the drawings open up for different kinds of interpretations of a subject. Does the text make me wonder?

RESONANCE: If a text resonates with me, it is because I can relate the content to something, I have experienced in practice. It can be a similar, an opposite or a nuanced experience of the content expressed by the author. It can also interrupt with my view on a certain subject, which drives me into further exploration of the subject.

ELABORATION: The experience of resonance sparks an interest of elaborating both my empirical data and the theoretical perspectives at hand. Thus, it constitutes the foundation of the abductive inquiry process, connecting theory and practice. Here the personal experiences is combined and discussed in relation to the experiences of others.

SHARING: The development of new ideas and designs often takes place in a dialogue with peers, using different kinds of materials. The sharing can take different formats ranging from internal feedback in design groups to feedback with external stakeholders.

The four phases should not be seen as separate entities. On contrary, they should be viewed as intertwined and overlapping phases supporting the connection between theory and practice. The Drawing Connections Model should be seen as a first sketch, which I will go into further conversation with alone and hopefully with other practitioners and researchers.

For now, I draw a line between the 'adventures of thought' for this research project and further investigations. Thus, I go to the final conclusion in next chapter.

Chapter 9: Conclusion - connecting the lines

This chapter will conclude the research project based on both the research question posed in Chapter 1 and reflection on the prior chapters and papers. Thus, I will synthesise and discuss the results of the research project. In the six papers, I have approached the research area from different angles and each paper feeds into discussions related to the two parts of the research question, as described in Chapter 7 and illustrated in figure 39. The findings presented below are chosen with a focus on extracting the most interesting and valuable results across the papers. When connecting the lines between the papers, redundancy in relation to the individual papers will occur, as this approach condenses the insights and lessons learned throughout the research project. Even so, the findings will be presented in a more general manner in order to connect the different papers' contributions to answering the overall research question. Thus, I also aim to draw connections between theoretical and practical claims that potentially can transcend the local contexts of the project (Barab and Squire, 2004, p. 8).

9.1. How is graphic and visual facilitation being practised?

As this research project aimed to draw connections from the organisational context to a higher educational context, there was a focus on learning processes and teaching processes from both teachers' and learners' perspectives. Thus, this research project also reflects the practice of graphic and visual facilitation in the broader social context of meeting culture in organisations and problem-based learning processes in higher education.

The purpose of Paper 1 was to illustrate the practical application of graphic facilitation with the aim of outlining suggestions for future research in relation to educational and organisational contexts. Based on the review, this Paper contributes towards *identifying a research gap in the field of graphic facilitation*. Thus, it was an outset for conducting the research project.

The results from the literature review were presented in three themes that were analysed in preparation for further research:

1. Graphic facilitation: analogue drawing techniques, icons, and models
2. The graphic facilitator: roles, responsibilities, and dominant concepts
3. Design sketching as a concept in graphic facilitation

Moreover, two additional perspectives for future research were presented:

- A pragmatic approach and social learning perspectives in graphic facilitation
- Graphic facilitation and digital possibilities

The themes and suggestions for further research in Paper 1 informed the outset and direction for the research project and in the rest of the chapter, I will address the themes in relation to the research results. To structure the sections, the first three themes from the review are addressed under this section and the two additional themes are addressed in the next section 8.2. As the themes are interconnected and expand over both the organisational and higher educational contexts, overlaps will occur.

The literature review demonstrated the need for empirical studies of participants, the forms of interaction and role distribution, as well as studies of digital possibilities in graphic facilitation aimed at supporting collaborative learning and reflection processes among employees and students. As future steps in qualifying the empirical research, interventions were suggested to be designed and tried iteratively, with continuous theoretical reflection aimed at analysing their applicability to practice (Hautopp and Ørngreen, 2018, p. 59). The methodological contribution of this research project will be addressed in section 9.3.

Graphic facilitation: analogue drawing techniques, icons, and models

The literature review showed that analogue drawing techniques are referred to as the typical way of doing graphic facilitation, where the facilitator draws on large pieces of wall-paper while involving participants and using their utterances to visualize and organize what is said (e.g., Sibbet, 2001; Tyler et al., 2005; Valenza and Adkins, 2009). Thus, the drawing activity in graphic facilitation is typically performed by the facilitator based on the dialogue with participants. Practitioners within the field point to an awareness of the facilitators' definition power in dialogues with the pen at hand (Nielsen et al., 2016) and advocate for distributing the pen to participants, which echoes advice from other practitioners (Blijsie, Hamons and Smith, 2019). However, there is a lack of long-term perspectives on distributing the roles in graphic facilitation (Paper 1). This research project contributes to the development of the roles in graphic and visual facilitation by placing an emphasis on the participants as *active drawers* in meetings and group processes. By investigating basic courses in graphic facilitation and conducting follow-up interviews with both teachers and participants, I was able to gain insights into teaching situations of graphic and visual facilitation and long-term perspectives experienced by the participants involved.

The research in Paper 3 contributes to the knowledge about how employees incorporate visual methods in their own work practices as they transition from training to practice. The analysis shows that the trainees continued working with graphic facilitation during the two-year period after completing the basic graphic facilitation course, where they had evolved and expanded their repertoire (Schön, 1983). The trainees have all worked on individual, small group and group levels, but have not tried larger scale interventions, as seen in the review of graphic facilitation (Tyler, Valek and Rowland, 2005). The findings show that the drawing practices allowed the trainees to show and use various parts of their academic competences, such as creative, humorous and informal aspects in their professional lives. Furthermore, the use of drawings made a difference in the trainees' preparation for meetings, where they were able to highlight essential points in their PowerPoint presentations. The trainees expressed how they were known by their colleagues as 'the drawer' at their workplace, also aiding colleagues to use drawings in their meeting facilitation. These results also points to the value that the trainees' use of graphic facilitation brings to their organisations. However, this research does not investigate the perspective seen directly from the participating colleagues' who experienced the graphic facilitated meetings. This is a limitation of our research and we recommend including this perspective in future research.

Based on the different visual formats presented in the paper, the findings show that the trainees typically used visual templates or presentation drawings in their facilitation of meetings. Thus, the research project supports the inclusion of various visual formats as part of graphic and visual facilitation practice. However, the study also illuminates a request from trainees for further practice in doing both during meetings, as they may feel challenged when live drawing. Thus, there is a need for

teaching that focus on both drawing and facilitation skills combined. A further investigation of the organisational context identified the need to use both the term 'graphic facilitation' and 'visual facilitation' to understand the movements in the emerging field. This research project reflects the practice of graphic and visual facilitation in the broader social context of meeting culture in organisations and problem-based learning processes in higher education.

The graphic facilitator: roles, responsibilities, and dominant concepts

The ethnographic study in Paper 2 contributes to the knowledge about the dynamic framing and reframing of teaching situations in basic graphic facilitation courses. Thus, the empirical study provides insights into significant aspects of the interplay between the facilitator (in the role of the teacher), the participants and the visual display (Smith, 2014). The study demonstrates how the use of humour and visual metaphors became multimodal 'hooks' of social memories, which supported a playful and safe learning environment. Thus, this study addresses the teaching dilemma described in section 1.4. 'I want to draw – I cannot draw' – describing how participants in graphic facilitation courses feel enthusiastic about acquiring new skills in visual methods but at the same time are hesitant and lack self-confidence in their own drawing skills. The goal of this study is to address how the teachers tackled participants' anxiety in order to create a positive and safe learning environment. The findings show that the teachers played a crucial role in *initiating, acknowledging* and *supporting* the use of humour in the teaching situations. Furthermore, a significant didactical consideration of 'drawing ugly' was identified as a way for the teachers to support a playful and positive learning environment. The study contributes with theory building by combining theories of play and humour (Bateson, 2014; Banas et al., 2011) with a sociocultural approach to multimodality in reasoning (Ivarsson, Säljo and Linderoth, 2009). Furthermore, the practical implication of graphic facilitation allowed for the visual documentation of spontaneous play, which is not usually observable (Goffmann, 1974; Bateson, 2014). Besides contributing to the empirical research within the field of graphic facilitation, the study also contributes to the empirical research on the function of spontaneous play among adults in a natural setting, which has been requested by the play research field (e.g., Glenn and Knapp, 1984).

Design sketching as a concept in graphic facilitation

Throughout the dissertation and the papers, the connection between design sketching and graphic facilitation has been investigating and several similarities and differences has been identified. From the architect field, the 'language of designing' (Schön, 1983) combining the non-verbal and verbal language was identified as common interest between the two practices, where both idea generation and dialogue is essential. Concepts derived from the design field; the act of going into a conversation with materials – backtalk (Schön, 1983; Goldschmidt, 2003) and making ideas public for discussion (Twersky and Suwa, 2009) and identifying different design modes (Olafsson and Sjölen, 2007) was found beneficial as a theoretical backbone, when explaining the interactions between the facilitator, participants and the visual display (Smith, 2014) in graphic and visual facilitation. Similarities in teaching activities such as desk-crit and pin-ups (Hyam, 2020) could be seen, when the intention was to provide concrete feedback on students' visual productions as well as providing space for students to present their final design concepts for external stakeholders. However, as the research shows, there were also significant differences between the drawing practices in the architect/design field and the graphic/visual facilitation field. The graphic and visual facilitation practice is identified to be more collaborative and process-oriented, where the idea generation and dialogues around ideas are performed simultaneously. This is an overall characterisation of the drawing practices in the fields,

and there will be nuances related to specific use in each field, as these are context related. However, this research project argues that graphic and visual facilitation can introduce humanities students to a visual vocabulary suited for their context for developing *concept* and *processes* operationalised in e.g. learning and communication designs. Here, the introduction of simple icons and models can lay a foundation for the students' further development of own visual language suited their contexts. Thus, the act of drawing is process-oriented (Agerbeck, 2012), concerned with the discussion of concepts in groups, rather than product oriented, i.e. focused on the development of a specific product.

Findings derived from investigating the organisational context was reflected and incorporated in the design experiments targeted the higher educational context. Thus, the aim was for the design experiments to rely on significant characteristics of doing graphic and visual facilitation in organisational context and also to expand and explore further possibilities in a higher educational context.

9.2. How can graphic and visual facilitation support students' design exploration in higher education?

This research project, which was grounded in the use of visual methods, also took an explorative approach to investigating the implication of introducing graphic and visual facilitation in higher educational contexts. Thus, a development of several design experiments was organised to investigate the last part of the research question.

A pragmatic approach and social learning perspectives in graphic facilitation

It can be argued that my working hypothesis: *a combination of graphic and visual facilitation and sketching can provide an operationalisation of pragmatic inquiry perspectives for humanities students to enter design exploration in higher education,* was proven to be right in several instances, when students expressed a broader and more in-depth understanding of the pragmatic inquiry approach to research, as analysed e.g. in Paper 6: *4.2.3 Students' reflections on the use of visual methods as academic practices.* The act of drawing enabled the students to align effort and collectively discuss directions for their design explorations, combining empirical data and theories (e.g. Paper 5). Thus, the visual methods provided stronger connections between theory and practice.

In each of the design experiments presented in Papers 4, 5 and 6, the students were encouraged to take the role of game designers (Paper 4), digital learning designers (Paper 5) or communication designers (Paper 6). Thus, all student groups were tasked to engage in critical inquiry when designing social interactions for others to engage with, e.g. developing games for change (Paper 4). The research contributes with an explicit focus on *the two-fold function of DBR* to support the students' design exploration in higher education. Thus, it shows the importance of DBR as an iterative research frame for the ongoing development of the design experiments and as a teaching frame, in which students were prompted to take the role as designers entering design exploration in a specific context. It was significant to place students as *active drawers* and for the teacher to provide visual examples of own inquiry processes to *show* the visual methods instead of only talk about it. The research provides a thorough visual analysis and discussion of *the teacher as a role model,* when introducing *drawing as an academic dialogue tool* for humanities students who are not familiar with these ways of working in

academia. Furthermore, the research shows how teachers' facilitation of visual methods familiar to art students, also provided space for bridging connections between art and games – between the familiar and unfamiliar (as analysed in Paper 4). Thus, the teachers' role in *creating spaces for joint inquiry* is emphasised as crucial for supporting students' design explorations.

The findings show that the students used their own practical experiences with visual production to reflect on how to create utilisation contexts for their target group to engage with. For example, drawing became a significant pedagogical consideration in the students' digital learning design (Paper 5) and in their communication design to make an exhibition more accessible to visitors (Paper 6). Through their own experiences with materials, the students were inspired to reflect on how to encompass the visual methods as a significant part of their own design, also reflecting on the potentials and barriers of the methods, e.g. providing different access for participants to enter reflective exercises, not assuming anyone would prefer drawing activities (Paper 6). These reflections concerning the utilization phase (Pauwels and Mannay, 2020) is seen across papers, where the trainees are sensitive to various groups' needs and personal preferences when implementing graphic facilitation in their daily work (Paper 3). Thus, findings across papers points to participants' engagement in the visual practices, but also a critical stand reflecting on suitability regarding the utilization phase and target groups. It can be argued that the results of this research project also contributes with insights on the humanities students' cross-disciplinary work combining different materials and technologies in their design explorations.

Even though the students were explicitly encouraged to reflect theoretically on their work through visuals and to incorporate these visuals into their final exams, the findings show that some students perceived the methods as practical tools (Paper 5) and were doubtful whether to include the materials in the dialogue in the exam situation (Paper 6). Here the examiners had an important role of acknowledging and supporting the students' use of visual materials in the exam situations – an emphasis on the supportive role of the teachers when creating a safe and positive learning environment as identified in Paper 2. However, the research project points to a continuous need for students to acquire a variety of concepts so that they can discuss and acknowledge these ways of working in higher education. The better we as teachers become at developing a language to address the value of visual inquiry approaches, the better we can support students' meta-reflections on their pragmatic design processes. Going forward, when teaching visual and graphic facilitation, it is crucial to support this vocabulary through joint inquiry with the students.

Graphic facilitation and digital possibilities

Throughout this research project, I have negotiated with the contexts in the specific teaching situations and elaborated on the combination of graphic and visual facilitation and sketching as an academic practice. Thus, I have explored this combination in relation to the use of drawing in ethnographic fieldwork and in relation to students' development of digital prototypes and animation-based sketching videos. The research project does not provide a clear definition on, whether these combinations can be characterised as graphic and visual facilitation. However, the research project points to an ambiguity and openness in the field to encompass a variety of understandings. In line with a growing interest in digital possibilities within the field, this research project has also addressed several perspectives.

The research project shows how the students appreciated the visual practice as a driver for their collaborative group work and theoretical reflections. However, there was also a request for further integrations of digital sketching tools (Buxton, 2007) which is suggested as a future research scope within the humanities (Paper 5). Thus, I also experimented with including animation-based sketching in the design experiment as a way to bring the more temporal and narrative aspect into design processes. Here, the findings showed that the animation-based sketches functioned as both ideation and dialogue in the students' design exploration. Likewise, the combination of visual facilitation and sketching techniques was used and redesigned for the videos. Thus, it can be argued that the introduction of initial drawing techniques also supported the students' further investigation and video production. Through different experimentation of both hybrid and online teaching, the use of document camera was emphasised as a relevant practice in higher education, where the drawing exercises were shown from a position relatable to the students working positions in their groups (Paper 6). In the online teaching formats, the teachers' ways to balance feedback-related video introductions and teachers' time for preparation are identified as a relevant issue for further investigation, when working with visual facilitated online spaces.

As a final point in this section, I especially education' (Paper 6), where this model over students' approaches to utilization of visual materials in the exam situation is presented:

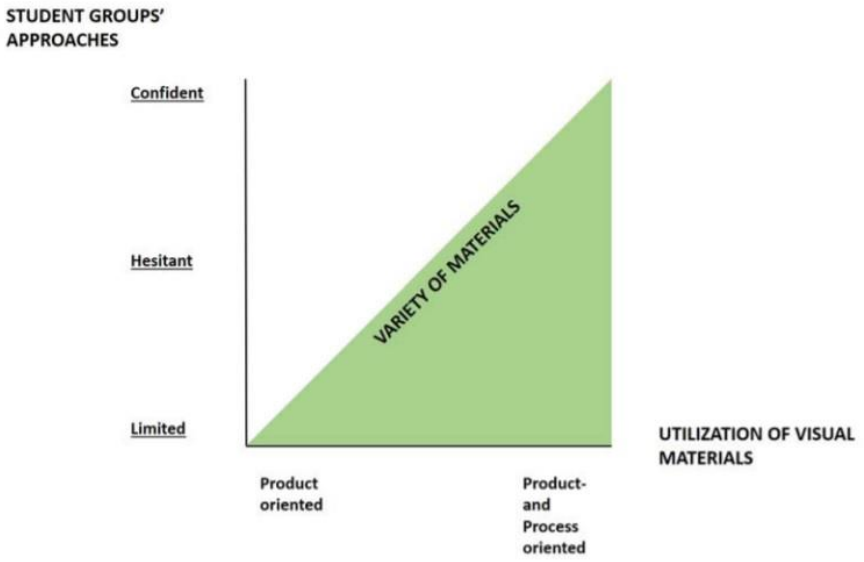

Figure 7. Model illustrating the student groups' approaches to the utilization of visual materials in the exam situations

Figure 47: Model illustrating students' utilization of visual materials in the exam situation (Paper 6)

In Paper 6, I argue that the 'confident student groups' are taking a risk when including and explicitly referring to their visual materials in the exam situations. This analysis of the empirical data is based on other studies, which conclude that students in general lack experiences of bringing these kinds of materials into exam situations, because they are not used to these processes being taught nor measured at the universities (Warren and Payton, 2021).

However, to question the findings, there may be another analytical point made that the 'confident groups' are actually following the guidance from the teachers, prompting them to bring their visual materials to the exam situation. In this perspective, it can be argued that these student groups are

following the guidelines for this course regardless of their previous experiences of including visual materials in exam situations. A further suggestion for future studies would be to interview students about their experiences of the exam situations compared to their prior experiences of exams at university. Here, the experiences from using *drawing as a research approach* in Paper 2 and 3, could be beneficial to ground the students' experiences in the specific exam situation.

The model is derived as an analytical result in the local context of this specific design experiment (Barab and Squire, 2014). However, I will argue that the model can function as a didactical tool for teachers to be aware of the students' different strategies for using visual materials both during their design explorations at the courses and in their final exams. The model can also function as a reminder for teachers when organising design courses, to explicitly frame how visual materials are expected to be part in the students' exams supporting the process- oriented dialogues around their inquiry processes conducted through the course.

The design experiments showed the students in general appreciated the different feedback sessions with peers, teachers and external stakeholders, which supported the joint inquiry. The research project suggest a further experimentation of exam situations to strengthen a more authentic assessment of students' creative and designerly ways of working in higher education

9.3. Methodological contribution

Through this research project, I have experimented with incorporating drawing as a part of both research and teaching processes. Three significant ways of this exploration has been analysed and discussed in details:

4. Exploration of drawings as a means of doing visual research
5. Exploration of drawings as a means of developing educational designs
6. Exploration of drawings as a means of presenting research

This research project contributes to the knowledge on how higher educational teachers might engage in design processes, which are knowledge that the research area that have been requested (Goodyear, 2015). Thus, this research project joins the ongoing dialogues aimed at understanding education as designs for learning (Boistrup and Selander, 2022). By the rich and visual descriptions of PBL activities, student work and reflective evaluations in each design experiment the research project can function as inspiration for applying similar approaches to new local contexts in higher education. Moreover, the approaches used in this research project, may lay a groundwork for further investigation of the use of graphic and visual facilitation in organisational and higher educational contexts.

Based on the exploration of drawing as a significant part of different phases of research, I suggest 'The Drawing Model' as a way to articulate the pragmatic inquiry processes of designers and researchers in academic practice. The interplay between the phases of *inspiration, resonance, elaboration and sharing* acknowledge the multimodal, creative and critical inquiry approaches in academia. Thus, the purpose is to provide a language for illuminating and describing design exploration and design decisions in academia, which often relies on negotiating reality (Frayling, 1993) through different materials (e.g. Goldschmidt, 2003) rather than making decisions based on rationality and logical thinking alone (Nussbaum, 2016).

As the field of graphic and visual facilitation is identified as being ‘on the move’, this research project has aimed to build a theoretical groundwork derived from practice-based analysis to strengthen the empirical research within the field.

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Appendix overview

Appendix A: Drawing exercises – distributed in a scanned pdf (17 pages)

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