Learn**x**Design

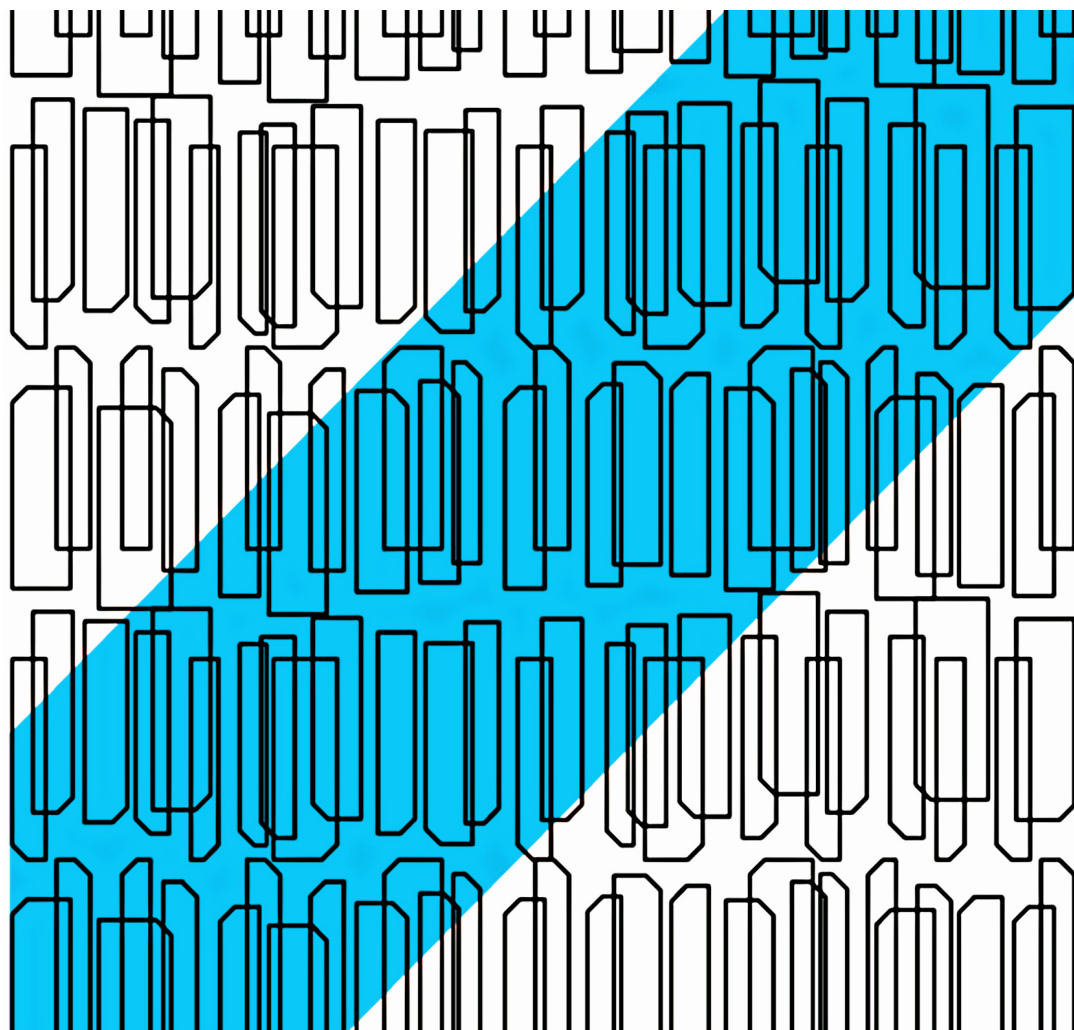## Proceedings of the 3rd International Conference for Design Education Researchers

Robin VandeZande   Erik Bohemia   Ingvild Digranes

Time to Explore and Make Sense of Complexity?

Nina BJØRNSTAD[a]* and Monika HESTAD[b]

[a] Oslo School of Architecture and Design [b] Central Saint Martins, University of Arts London / Oslo School of Architecture and Design
*nina.bjornstad@aho.no

Abstract: *Industrial design is in transition and there is a pressure to deal with even more intangible concepts. This leads to the introduction of new skill bases into the education. However, with inclusion of new skill bases the question is what needs to go? Using an action research framework we investigated how a university industrial design module changed when introducing more input on research and service design. We analysed the projects from two different years and asked whether the students had managed to integrate the input and if this led to more informed processes or a better result. The projects from one year had less novel solutions and less complexity than the previous year. While the students appreciated new skills that were learned, they found that their process was rushed. Lack of time to iterate and reflect affected the final outcome. Exploration develops industrial designers' sensibility and ability to facilitate experiences, but an emphasis on formalised research led to less time to explore. In our eagerness to 'professionalise' the industrial design education, are we about to leave out our core skills?*

Keywords: *Industrial design, Design education, Exploration, Analysis, Design thinking.*

Introduction

Across the globe designers experience a profession in transition (Yee et al., 2010) with the inclusion of a greater need to negotiate with external partners and become professionalised researchers (Press et al., 2003), developing business models (Abbing 2010; Yee et al., 2013), innovation cultures (Kochargaonkar and Boult, 2014) and similar, and with this the inclusion of more intangible concepts and questions with which to engage.

As a result of widening the scope of what is considered part of the designers' core knowledge base, design education is changing. Skills associated with artisan practices of design are no longer the only knowledge bases that designers need to acquire (Yee et al., 2013). However, with the constant inclusion of new knowledge bases, methods and approaches, there will naturally be pressure to leave something out. The tension explored in this paper is, when bringing in a more rigid analytical approach from business as well as from science, what happens to the time to explore and experiment, and how does this change the designers' core capabilities?

In this paper we will offer a critical examination of a module that is part of a degree course that has experienced these transformations towards more conceptual and intangible output. This module is the first introduction the students have to branding and management. It is project-led, with the students developing a product concept at the same time as they develop a brand concept. This means the students have two complex syntheses of knowledge to make, one that includes their insights about a new product concept and one that includes insights about the brand concept. The complexity in the task is to make these two syntheses relate to each other as well as making the justifications of why they do. A more detailed presentation of the syntheses will be addressed later in the paper.

In the autumn 2014 module, the theoretical input on the course increased to meet demands to professionalise the research that the students are building their concepts upon, as well as to include more service design thinking. The inclusion of more knowledge did not somehow lead to better concepts. On the contrary, it seems to have led to less interesting concepts and created pressure on the students that was beyond what they had the capacity to absorb. The general feeling we were left with was that, in the autumn 2014 module, the balance between time to explore and develop the project and time to obtain the input was not right. Therefore, as part of evaluation of the course we arranged a meeting with our students from this module. The student representatives expressed that they were satisfied with what they learned overall this year, but that they were not satisfied with their final solutions. They expressed less confidence in what they delivered this year than we have experienced from previous years.

This paper offers a critical evaluation of the module before the change in 2014 and after the change. The aim of the study is to more systematically develop the learning environment (Light et al., 2011). The challenges identified will therefore be taken into consideration when developing the learning module in 2015. As the research is contextually rich it also opens up for multiple facets and dimensions; in this paper the focus will be on the students' ability to make the complex synthesis. In the core of making these complex syntheses is the balance between building their insights and knowledge on analytical processes, and on the more subjective nature that comes in a more free flowing

exploration. The balance between rigid analysis and free form exploration in developing complex synthesis will be the key consideration undertaken in this paper.

The dynamic interplay between analysis and exploration

Design has been described as a hybrid activity that could include multiple knowledge bodies from art, from science and from mathematics (Jones, 2009). In designing, the navigation of these fields and identification of which of them are needed in the context they are working on is part of the complexity. In addition the designers will have to work with vague challenges, then to transfer insights gained about the challenge into concrete propositions (Tovey, 2009). In order to understand and build on multiple knowledge bodies the designer will have to engage with various experts in their processes, and will by this need to know about different related fields but will not become the expert. Their own expertise will be needed to navigate in this complexity, and later to transfer this into a new concept. This navigation will include both analysis of the context as well as making creative decisions that only in the retrospect can be explained. An important part of the designers' expertise is form and 'formgiving' (Akner-Koler, 2007).

The propositions that the designer makes are often presented as visual material; it could be sketches as well as prototypes. By making the propositions concrete, they will be accessible for others than just the designer to engage with, to critique and to question. How the designers are creating these propositions is not always so easy to explain and designers are not always themselves the best to explain the designed object. An important part of this explanation is the 'reflection in action' as introduced by Donald Schön (1991). In exploration with physical prototypes the thought patterns become clearer and more explicit. Visual communication is an intuitive way to explore ideas and proposals (Minichiello and Anelli, 2012), but it takes skills and practice to make this a medium to communicate a complex proposition.

The designer has an ability to make proposition and to concretise synthesis from vague problems (Tovey, 2012), which creates new opportunity in other fields as there is something in the way designers are thinking that proves promising to tackle other problems outside the traditional design work. However, in the discourse around design thinking the part of the approach that includes subjective reasoning is more challenging to explain. According to Roger Martin, design thinking is 'analytical mastery and intuitive originality in a dynamic interplay' (2009, p. 6). Design thinking, he says, brings together both the 'analytical' school which is about creating rigidity behind decision making, with the 'intuitive' which builds on the school of thought that is 'the art of knowing without reasoning'. From our experience as teachers, this 'intuitive reasoning' does not seem to come of itself. The 'intuition' for which insights to combine, and how to combine them into concrete proposition, comes by practice. Further, the designer also needs the skills to be able to work with the material and create these concretisations, through exploration in sketches (Minichiello and Anelli, 2012) or other flexible materials that can become a medium to quickly develop their thought processes and capture their thinking. The job of the designer becomes to understand the challenge, identify right sources for information, gain the insights and then transform it into artefacts. This is not a straightforward job – and it is not always easy to find the right balance between the hard facts and rigidity needed to develop informed decisions and to allow the time needed to develop skills in explorations.

Engaging with changed social context

In the module that is evaluated in this paper, a key learning objective has been to prepare the students to navigate complexity in the market as well as in society. The students are encouraged to engage with major drivers of changes in society and to use these changes as a source of inspiration as well as a tool to make relevant the concepts that the students are developing. The module builds on theories in branding that see the brand as a dynamic process with multiple stakeholders being part of developing what the brand is about (Holt, 2002, 2004). The consideration in the branding literature has been from a design perspective, where the aim is to create meaningful propositions that could become brands.

In the academic development of teaching a similar change as the one in branding can be observed. Building on Schön's 'reflective practitioner' theory (Schön, 1991 [1983]), Light et al. (2011) argue for a new role relevant in teaching: 'reflective professionals'. The call for professionalism: '…requires a model of practice that must account not only for the events and situations that arise in practice but also for the changing social context of practice' (Light et al., 2011, p.14). This has a parallel with our aim in the examined module to develop students that move beyond reflective practitioner in dialogue with an object, to become 'reflective professionals' where the object represents the synthesis of an on-going process in dialogue with various actors as well as larger changes in society.

However, there are multiple challenges that arise in this. For example, the same insight could give multiple interpretations, or the insight that is built upon is flawed. There could also be practical hindrances such as that the medium chosen to communicate the insights were not flexible enough, or that the designer did not have the skills needed to communicate their insights. The transfer process from insights to medium can be described as semantic transformation, and in this semantic transformation distortion may happen (Karjalainen, 2004).

From an educational point of view there is a complexity in finding the right balance. How can we create learning activities that both introduces the necessary analytical frameworks they will need to create robust insights to build their propositions from, and at the same time allow them time to learn by exploration and which is such a crucial part of developing their intuitive reasoning? Before going deeper into this challenge, we will first look at the Institute to give context to the challenge presented.

Constant negotiation of tensions

Oslo School of Architecture and Design offers a five-year master's course in design. The previous design education was an industrial design degree. In the last decade it has changed to now offer a two years' specialisation in interaction design and service design, industrial design or system-oriented design on top of the three-year undergraduate years of the course.

Changes and negotiation between different methods, knowledge basis and approaches to design is part of the history of the institute. It can be traced back to the establishment of the Norwegian Association of Applied Art in 1918 (Romsaas, 2009), whilst a permanent course in industrial design was only established as late as 1983. In developing the first syllabus, organisations from industry and politics, and representatives from the profession, worked together. This included the Norwegian Federation of Sales and Advertisement.

The tension between the exploratory and the analytic rigidity is a part of the history. From the very beginning the course found itself in an on-going discussion between the Head of Industrial Design, Torbjørn Rygh, and the course's parent institution, the National College of Art and Design (NCAD), on whether the pedagogy was built on an aesthetical or a technological ground. NCAD, where the course was first located, was the country's leading arts school. At the same time there was an academically ambitious attitude at the Institute of Industrial Design, which suggested that the Institute should leave the arts school (Romsaas, 2009). In 1996 the institute joined Oslo School of Architecture and Design. The latter institution is categorised as a scientific school (specialised university) rather than an arts school, and therefore closer to the technology ambitions that the leadership of the Institute held.

The previous tension between aesthetics and technology are today history, as aesthetics is one of the focus areas and technology is still part of the curricula. The Institute has recently agreed on a 'designerly' approach, referring to three pillars defined as methods, aesthetics and communication (Troye, 2014). However, the recent pressure on including new frameworks, methods and skills as a result of including interaction design and service design as possible specialisations seems to once again have created internal tensions. With the current range of specialisation offered, how should the first three years prepare the students to make educated decisions of which specialisation to apply for? This in reality means moving away from the industrial design foundation that the course is built upon, to allow the new disciplines such as interaction design and service design take a greater part of the curriculum.

The module examined

The scope of the study in this paper is a four-month module named *Identity in products, services and interactions*. The aim of the module is for the students to explore how the branded context can set the agenda for the products or services and vice versa (Abbing, 2010; Karjalainen, 2004; Hestad, 2013). The students are encouraged to create visions that are relevant for society as well as bringing something new to the market. New in this context could be either original products or services, but it could also be new brand concepts.

The students get introduced to marketing and branding. In addition to the experimentation and formgiving, the students are supposed to take the cultural, ecological, economic, ergonomic and user-centred aspects into account. They should know their users and they also have to interact with them. Further, the students also have to reflect upon their solution from an ethical perspective (Keitch and Bjørnstad, 2010). The module is project driven and the students are creating a branded context of how they would like to propose their solutions to their imagined users.

The complexity that lies in both creating a new product or service parallel with creating a brand context, makes the third year a good time to introduce this module. Before this module the students should have a basic understanding of design and formgiving as well as research, with a focus on user-centred research. Exploration in various materials as well as digital exploration is part of their curriculum before this course. They should therefore be able to explore and experiment in the process. Vision based design proposals demand

some experience, and the students have gained enough experience in the third year to experiment on self-generated ideas.

In the autumn module of 2014 we introduced more formalised research classes than in previous years and at the same time service design classes. In the design research classes the students were introduced to creating a research plan, of various methods for investigating the user. They were introduced to the academic theories behind these as well as being asked to deliver a research plan and conduct their study according to that plan. The theory and methods in the design research course were introduced at the same time as the theory and methods on branding. These two parts took up an equal amount of time and which meant that the students had a heavily theoretical introduction to the course.

The service design course was planned as a short introduction and was task based. The students were introduced to new tools such as the customer blueprint and the user journey. The service design classes did not take up that much more time of the schedule. Also the branding and service design courses have overlapping theories and methods. In branding it is important to express the brand through various touch points, to involve multiple stakeholders and to understand how the brand is experienced through time (Wheeler, 2014). These are also important considerations when developing a service.

A method to investigate the change

To investigate the change the authors planned the study as a critical evaluation of the course and decided to do a comparative study between the projects in 2013 and the projects in 2014. The study was planned as a combination of a case study research and action research. Case study research is a method that can be used when the challenges to explore are highly context dependent (Flyvjberg, 2004). Action research is a method for when the aim is to implement changes to improve the learning environment (Koshy, 2010). The action research is planned in cycles; observe, reflect, plan, act (Leary quoted in Koshy, 2010). A challenge is observed and reflected upon, and then a plan on how to act upon this is formed and implemented. From this new observations are made. However, in this paper the reflection of the change is based on a reconstruction of the already conducted module and not as part of an ongoing module. This will therefore not be a complete action research project. It could though form a very good starting point for an action research project in the future.

There are several limitations of the study that needs to be addressed. We are not independent as this is our own course that is being examined. This means that there will be biases as to what is important to emphasise in the course as well as on how the projects are interpreted. This is met by constantly questioning our own propositions and by being transparent about what these are. Another challenge with contextual dependent cases is that the material is very rich, while the write-up will have to focus on one aspect of the case. In this article we choose to focus on the development of the complex synthesis and the balance between analysis and explorative approaches. The reason for this is that we see this as the most important challenge at this time.

Another issue is that this year the topic introduced to the students that was the starting point of their project was a challenge in itself. In the autumn 2013 module the topic of the course was to reinvent an old story. The students had to identify a story from history that may have been lost and use this story as a starting point in their processes. In

2014 the topic of the course was far more political as the students worked with gender stigmatization. Some of the students found this to be a personally challenging topic.

Data and analysis

Each of the years were treated as their own case, and which were then compared with each other. In setting up the comparison of the module before and after the changes, we chose multiple sources of information to be able to triangulate our findings. The teaching in the module consists of a wide range of different teaching approaches (Light, et al., 2011), from the students' development of their own project, workshop and seminars, one-to-one supervision as well as regular discussions and lectures. The assessment is through presentations, models or other visual representations and a report. The sources were: the module descriptions and literature list, students' final presentations, student reports, the final evaluation and marks of the module (with an external examiner). Having taught in both of these modules we knew the process the students had been through, but we also used the student reports to verify whether our understanding was right. In addition we issued invitations to an evaluation meeting where we discussed the modules with three student representatives and with two of the co-teachers of the modules.

In each of the cohorts there were about 20 students. We decided to make a selection of ten from each cohort. In this selection we went for those that were well documented so it was possible to get an understanding of how they worked in the project, as well as those that gave us the best indication of use of theory and practice and how this had informed their process.

There will always be a significant number of variables to choose from in order to make an analysis of the projects and for this paper we simplified the process. We therefore experimented with different ways of analysing these and at the end we developed a simplified structure that looked at the output and the input. These were visualised in order to compare the different projects. The projects were analysed from various dimensions. This was done to gain a better understanding of the nature of the project and provided an indication of the students' understanding of how to put theory into practice. From these experimentations we found that two of these dimensions shed light on the questions that we explored.

1. COMPLEXITY OF THE SYNTHESES AND THE COHERENCE BETWEEN THEM

To investigate whether the students had managed to navigate the complexity in their proposals the projects were structured into three different categories: product-driven brand stories (e.g. stories about functionality, ergonomics, attributes, production); actor-driven brand stories (e.g. stories about the heritage or origin of the company or the creator/designer, the user, about creating together); and myth-driven brand stories. The brand story is not directly related to the product. The product gets a symbolic role in this story (e.g. stories about sub-cultures or society, a myth, a relation). This gave a way to see which level of abstractions the students worked on, as well as to quickly identify the coherence between the brand story and the product story.

2. EXPLORATION VERSUS NOVELTY

In the next analysis the processes were examined. Did the student demonstrate a high level of either material exploration or exploration through sketches in the design process?

This analysis was of key importance as this gave the opportunity to have a critical look at the students' processes and how their projects had developed. In this analysis novelty was also included. Novelty in this context refers to whether there is an established category in the market that was already recognised (like craft beer, shoes or similar) or not, as well as the novelty in the brand story, and novelty in expression. When the student suggested and was able to document that this was a potentially new category (or a new direction with an existing category), it was perceived as a high level of novelty, even if the aesthetic expression was perceived as less novel.

Less complex synthesis?

In 2014 the majority of the students' brand stories could be understood as product-driven (figure 1). This is not a problem in itself, however the novelty in the solutions did not suggest a product-driven brand story would suffice. There would be many competitors in the market and the solution they offered were not perceived as novel. The level of innovation as well as whether the solution is market-driven or is driving-market, would affect how the brand is perceived (Beverland et al., 2010). Further, several of the brand stories communicated an actor-driven story in part of the product or the imagery while other touch points, particularly in the text, communicated a product-driven story.
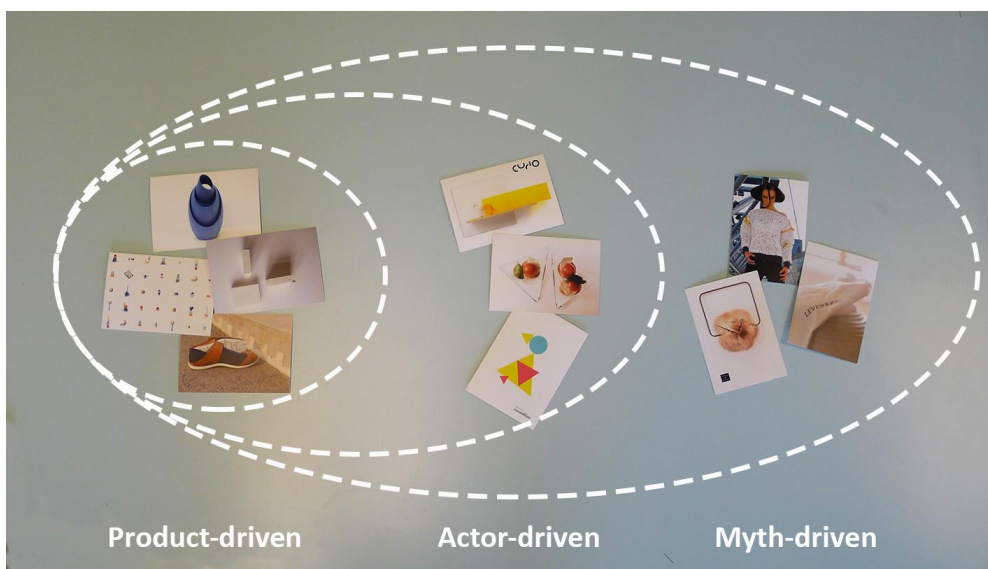

Figure 1: Coherence and level of abstraction in the story (autumn, 2013).
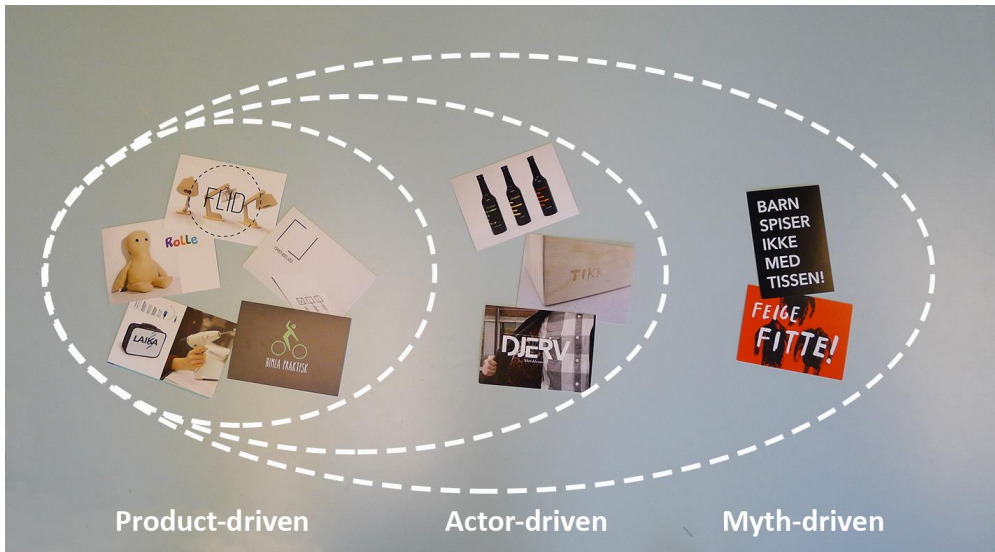
Figure 2: Coherence and level of abstraction in the story (autumn, 2014).

In both of the years (2013 and 2014) we identified projects that belonged to all three categories. However, in 2013 (figure 2) many of the projects belonged in the myth-driven brand story. The students had managed to create products that had a symbolic role in the brand story, and a coherence was created by the students being concerned with how the values were informing the development of the products/services as well as all of the other touch points that build the experience of the brand.

In 2013 there were only two stories that were product-driven. Both of these had a high degree of novelty in the solution, which justify a product-driven brand story. These two students were confident in how they presented the brand story and the products became strong statements.

Another interesting finding is that the theme in 2014 was far more abstract and related to a larger debate in society than the theme in 2013. Initially we thought this would lead to a higher degree of 'big questions' that would be explored, however, the opposite happened. The majority of the projects found niches in the market, rather than taking on bigger questions to tackle compared with the year before.

Organising the projects on an axis between experimental and novelty (see figures 3 and 4) we found that the 2013 cohort overall had a higher degree of novelty in their solutions. This supports our first finding that the synthesis seems to be less complex in 2014 than in 2013. It also gives an indication that there is not automatically a correspondence between having a larger rigidity in the data collection, ultimately leading to stronger synthesis. On the contrary, this may indicate that there seems to be a correspondence between the novelty and choosing an experimental approach. While, in 2014, there were fewer projects that had managed both. The most novel concept had a strong analytical approach in the finding, however, it was less exploratory. In 2014 there were few that had both an exploratory approach and a novel concept.
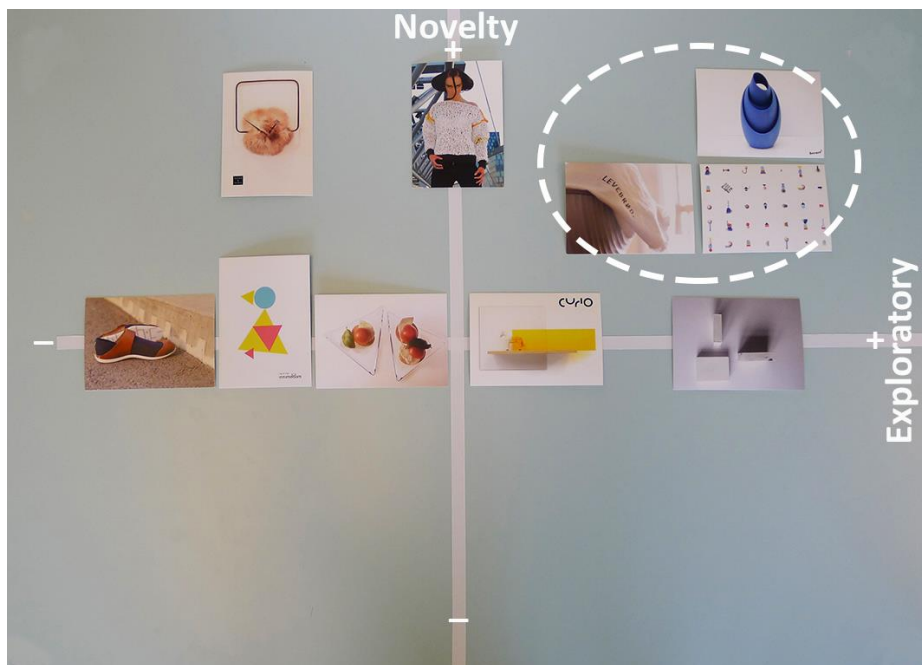
Figure 3: The student projects sorted in level of Experimental Design and Novelty (autumn, 2013).
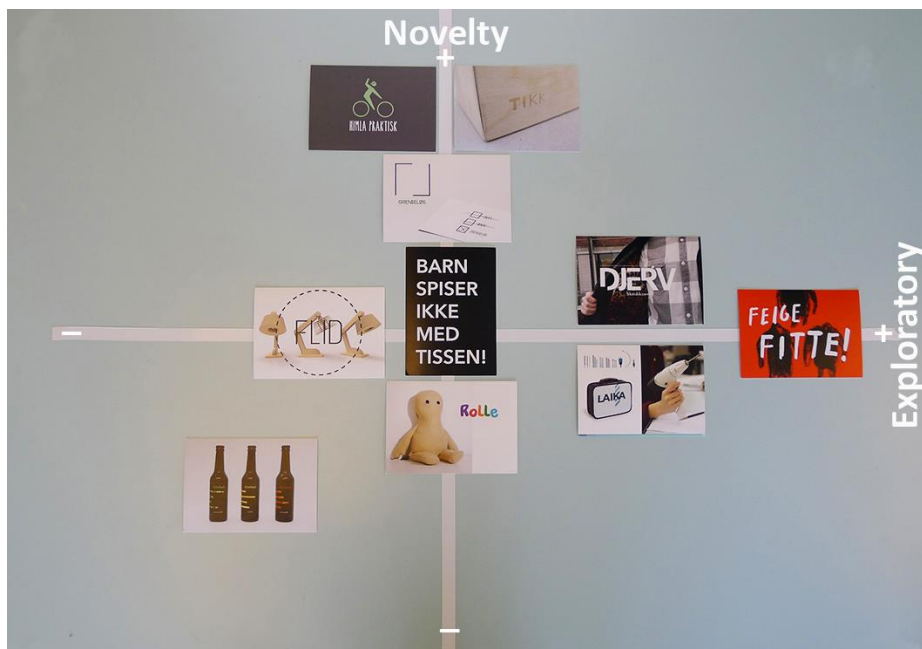

Figure 4: The student projects sorted in level of Experimental and Novelty (autumn, 2014).

Overall, there seems to be less complexity in the synthesis in 2014, than in the 2013 projects. The 2013 cohort managed to design stronger statements and these were skilfully communicated through all of the touch points to build a strong brand concept.

Time to make a synthesis

Seeing that the 2013 cohort overall demonstrated a more advanced synthesis with multiple projects that work on a high level of abstraction and complexity, and which appear more experimental and novel in the solutions, tells a story that the changed teaching changed the final results. Although there could be other factors that led to this that have not been examined in this paper. The theme the students in 2013 explored may be a richer and easier starting point and have rich stories to be inspired from. While in 2014, the theme chosen was in general perceived as more challenging and many of the students also chose questions that were demanding for them as individuals to relate to as starting points.

The students' own feedback in 2014 pointed towards a lack of time to iterate. The module in this year appeared too full of different topics and the students felt the structure forced them to take rushed decisions without the time necessary to reflect and iterate. This correlates with our own observations of this year. By not having the necessary time to work with the material, in making their own investigations, failure and successes, the students did not have the opportunity to iterate in the process, and the results became weaker.

In 2014 they were forced into a sequence of events, and which affected the processes and the results. The processes overall were less experimental and the results less original. The students were forced to make quick decisions when they worked with concept and form development. It is not a straightforward process to concretise insights into a brand and product concept. This is a time consuming activity that involves several iterations. The students in this module have to learn how to capture and analyse this, and materialise the findings in the objects. It means experimentation with materials as well as aesthetic exploration, as they learn more about what they are making and how this responds to the changes in society. In parallel with any creative exercise, whether it is about writing an essay or developing a form to a product, it is a process where while working on the solution and making adjustments, the thought processes become clearer and more refined.

Market, society and cultural engagement at this level are new topics for the students in this module. To come to the level of sophistication that is required to develop strong brand stories and products that are part of telling this story, they will need to have time to develop the story as well as the understanding of the underlying drivers. In addition the students already have a mind-set that is about production technology when they start to study the user. Their technology knowledge will at this stage be combined with the knowledge of the user. The information they gather has to be processed and made into concepts, and with the mind-set from technology it also needs to be possible to produce. In addition we also ask them to take a strategic stand, to consider the validity of what they offer from a commercial perspective and make ethical considerations on top of this. This means that the task is complex and, while the students develop skills in navigating this complexity, we also have to acknowledge the time they need to make errors and failures

before concluding, and delivering their thoughts both in written statements as well as materialised in all the touch points as a coherent whole.

What are we about to leave out?

The students are, as Donald Schön (1991) suggests, engaging with reflective conversations in action, which can be seen as the process between the student and the object that is in the making. However, as the field of design develops, the process of making must also be seen as a process of learning and engaging with insights from the outer world. There is a complexity in navigating through a constant change in society, in the market context and technology as well as in human behaviour. In this module it is the first time the students iterate a synthesis of this complexity, and the learning aim of this module has been to prepare the students to make this complex synthesis in the ever-changing context they will experience in their professional life. We have learnt that in developing our students' ability to become the 'reflective professionals' (Light et al., 2011) that can engage with the complexity in navigating change, they will have to have the time to iterate, fail and experiment in their processes. This will be one of the most important changes in the module. We will need to go back to the overall learning objective of this course. Important decisions will need to be made in identifying what will be the key objective and then planning the activities accordingly. This could help to better align the learning objective with activities and outcomes (Biggs, 2007).

With the continuous demand we experience for including new skill sets in the module, such as developing the student as a design researcher and similar, we seem to have lost sight of the complexity in this module to start with. In the development of the module, as well as the degree course it is part of, an important discussion will be whether the emphasis on new skills is starting to reduce the time our students have to develop their core skills. Another important consideration for us to have will be on the indication the findings gave us that the introduction of more formalised research, while lacking time to experiment and explore how the insights could be made into statements, leads to less novel as well as less complex synthesis. This could be because the students are still learners and will need time to absorb how they engage with the user insights. It could also be that there is a lack of a critical engagement with the research conducted to gain the insights. The students, therefore, fall into the trap of replicating what users says and using this to verify their concepts, rather than to engage with the insights critically and translate them into design concepts.

What we learned in our study is that aesthetic exploration in materials in the workshop or through digital exploration that is not defined is about more than acquiring basic skills. It is a highly necessary part of the design education for designers to develop their core skills, their thinking and their understanding of society, and becomes the medium to present their complex synthesis that can bring us forward. In light of this study, we will also emphasise the importance of allowing the students time to explore. In including new frameworks and theories from multiple disciplines we have less time for what used to be designers' strengths to visualise, experiment and to make the abstract concepts tangible. An important exercise for the *Institute of design* will be to critically examine all of the modules taught in the course. If the majority include more theories and frameworks that

help the students to become more analytical and make rational decisions, it is important to identify where the students could experiment to develop their intuitive reasoning.

The design discipline has opened up to other fields and 'designerly ways of knowing' (Cross, 2006) becomes increasingly important in a management context as well as in society in general. An important part of the interest in design is that designers have had a way to navigate in complexity and to make patterns and concepts that are innovative (Martin, 2009). The interest is based on designers' work. However, as designers develop into becoming facilitators, researchers or business managers, new tensions arise and new skill sets are in demand (Yee et al., 2013). In examining our own teaching practice we have observed that there are less students doing explorative work, and a general trend that design school workshops are downplayed. We will ask for a pause to reflect upon industrial design as a field, and the role of making things in developing the students' core skills. In design education, when preparing and developing our students to engage with bigger questions, is it not important to understand what made us relevant in the first place? Is there a value in exploring and experimenting as designers used to do, besides what we already do now? The question we will need to answer is, with the inclusion of all of these new skill sets, what is it we leave out? In relation to this, we also need to consider how important is that which we leave out compared with that which we include.

References

Abbing, E.R. (2010). *Brand-Driven Innovation.* London: Ava Publishing.

Akner-Koler, C. (2007). *Form & Formlessness*. Gothenburg: Chalmers University of Tecnhology, Axl Books.

Beverland, M., Napoli, J. & Farrelly, F. (2010). Can All Brands Innovate in the Same Way? A Typology of Brands, Position and Innovation Effort. *Journal of Product Innovation Management*, *27*, 33–48.

Biggs, J. & Tang, C. (2007). *Teaching for Quality Learning at University*. 3rd ed. Berkshire: Open University Press.

Cross, N. (2006). *Designerly Ways of Knowing*. London: Springer-Verlag.

Flyvbjerg, B. (2004). Five Misunderstandings about Case-Study Research. In Seal, C., Gobo, G., Gubrium, J. & Silverman, D. *Quality Research Practise* (pp. 390-403). London: Sage.

Hestad, M. (2013). *Branding and Product Design: An Integrated Perspective*. UK: Gower Applied Research.

Holt, D. (2002). Why Do Brands Cause Trouble? A Dialectical Theory of Consumer Culture and Branding. *Journal of Consumer Research, 29* (June 2002), 70–90.

Jones, C. J. (2009). What is designing? *Design Philosophies and Theories. Design studies: A reader*. Edited by Hazel Clark & David Brody, 77–80.

Karjalainen, T. M. (2004) *Semantic transformation in design: communicating strategic brand identity through product design references.* Publication series of the University of Art and Design: Helsinki.

Keitsch, M.M & Bjørnstad, N. (2010) Ethics in product design curriculum: An example from The Oslo School of Architecture and Design. In When Design Education and Design Research meet. *The Design Society*, 120–125.

Kochargaonkar, A. & Boult, J. (2014). Designing an Innovation Culture within and Entrepreneurial Environment. Design Management and Innovation *DMI:review: Design and Entrepreneurship: Thinkers, Makers & Doers, 25:3,* 10-16.

Koshy, V. (2010). *Action Research for Improving Educational Practice: A step-by-step guide.* 2nd ed. London: SAGE Publications.

Light, G., Cox, R. & Calkins, S. (2011). *Learning and Teaching in Higher Education: The Reflective Professional.* 2nd ed. London: SAGE Publications.

Lockwood, T. (2010). *Design thinking: Integrating Innovation, Customer Experiences, and Brand Value.* New York: Allworth Press.

Martin, R. (2009). *The Design of Business: Why Design Thinking is the Next Competive Advantage.* Boston, MA: Harvard Business Press.

Minichiello, M. & Anelli, L. (2012) Why do designers draw? *Design and Designing: a critical introduction.* Edited by S. Garner & Chris Evans. 82–96. London: Berg Publisher.

Neumeier, M. (2009). *The Designful Company: How to Build a Culture of Nonstop Innovation*. Berkeley, CA: Peachpit Press.

Press, M. & Cooper, R. (2003). *The Design Experience. The Role of Design and Designers in the Twenty-First Century*. Aldershot: Ashgate Publishing.

Romsaas, J. (2009). The Birth of an Institute. *Industrial Design. Shaping Futures.* Oslo: Oslo School of Architecture and Design.

Schön, D. (1991). *The Reflective Practitioner: How Professionals Think in Action.* Surrey: Ashgate.

Simon, H. (1994, [1969, 1981]). *The Science of the Artifical. 2nd ed*. USA: MIT Press.

Tovey, M. (2009) The Passport to Practice. *Design and Designing: a critical introduction.* Edited by S. Garner & Chris Evans. 82–96. London: Berg Publisher.

Troye, R. (2014). *[Institution] -Works Studies 2013-2014.* Oslo: Oslo School of Architecture and Design.

Yee, J., Jefferies E. & Tan, L. (2013). *Design Transitions: Inspiring Stories, Global Viewpoints, How Design is Changing.* Amsterdam, Netherlands: BIS Publishers.

Vogel, C. M. (2010). Notes on the Evolution of Design Thinking: A Work in Progress. In Lockwood, T. In *Design Thinking: Integrating Innovation, Customer Experience and Brand Value.* 3–14.

Wheeler, A. (2006). *Designing Brand Identity.* New Jersey: John Wiley & Sons.