

# PREPARING FOR DIPLOMA: FACILITATING AND OPTIMISING THE MENTAL JOURNEY

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## **ABSTRACT**

In higher design education, relevant preparation for professional practice in industry is vital for coming professional designers. Today, we experience that society, market mechanisms, technological optimisation and consumer behaviour become more and more diverse and complex. At AHO, our design student's ability to identify and flexibly grasp this complexity is challenged through the formulation of their final diploma assignment. The curriculum of our five years Master's degree in Design culminates with a diploma assignment, which constitutes the final and 10<sup>th</sup> semester. During the 9<sup>th</sup> semester the authors provide the students with a pre-diploma course, which aims at enabling the coming diploma students to build the framework for their diploma assignment and to formulate their specific proposal. As educators, the authors acknowledge the importance of mental preparation for this final assignment, as the pre-diploma semester course is tailored to facilitate a mental journey - or generative awareness process - aiming at building the required design thinking mind-set, perspective and reflection. The authors strive for a pedagogical regime consisting of individual tutoring on a regular basis, feedback during mid-term presentations, as well as utilising competencies from external professionals and partners. By advising each student into topical adjustments, and framing and reframing the scope, the authors encourage the students to maximise the relevance of their assignment. Through a qualitative and statistical survey during the pre-diploma semester, the level of each students' consciousness, reflection and awareness of the task has been registered consistently at every milestone during the course. The intention has been to investigate how these registrations contribute in describing the mental and qualitative level of preparation of each individual student, and the course as a whole. This statistical material has provided the authors with valuable insight into how our pedagogical regime has contributed in building the imperative mental journey.

*Keywords: Master in design, diploma assignment, survey, pedagogical regime, mental awareness*

## 1 INTRODUCTION

In our institution, the purpose of the final graduation assignment is to reflect each student's design skills and capabilities, to verify the appropriate level of competence that graduates hold, as well as preparing graduates for professional practice in industry. Our final diploma assignment represents a culmination of each student's chosen course path, which may be disciplinary or interdisciplinary, depending on the chosen course combination. Our professional disciplines consist of industrial design, interaction design, service design and systems oriented design course modules. Each of these professional disciplines represents different focal areas, utilising different mind-sets, methodologies and materiality.

The diversity and richness of course modules enables us to nurture each student into the exploration of professional disciplines, while building a substantial and robust body of competence, preparing the students for real-life practice in industry.

Formulating a constructive and relevant design project requires an ability to frame the scope of the task in an appropriate manner. Donald Schön [1] suggests that the concept of framing is fundamental for the design process, also describing together with Rein the designers' activity as 'reflection-in-action' and 'reflection-on-action' [2]. We believe that developing the diploma project description comprises both these mind-sets, as it requires both a divergent, reflective mode as well as a convergent, operational mode. As course responsible, our task has been to facilitate both these mind-sets in order to ensure that the students really understand the big picture; their role as designer,

consequences for society, and relevance for the end-user, as well as the need for attention to detail in the final solution.

Several studies have described how the framing process consists of both tacit knowledge and abductive reasoning [3]-[4]. The acknowledgement of this fact has been significant for us when preparing the course for the students. When being in the process of successively formulating the diploma project, each student has had the opportunity to follow own professional, disciplinary interest, and to optimise and refine their design skills and mental capabilities required for preparing for the assignment. In order to obtain this, the students have been encouraged to reflect upon their role as designer – their ‘mission’ in society- and to strive for the convergent process of formulating a robust design project description relevant to society, through criticality, self-reflection upon own strengths and weaknesses, and a successive determination of own professional passion.

While encouraging excellence, the pre-diploma course aims at assisting each student to develop a solid launch pad for the diploma project, which will enable research from a knowledgeable and critical position and with a clear plan. Regardless of chosen discipline, our students should develop competence and capabilities within design aspects such as societal understanding, analytical skills, problem solving, user behaviour, idea development, conceptualisation, prototyping, verbal argumentation skills and visual presentation techniques. The direction the project takes is essentially a result of a dialogue between the student and supervisor, tutors and institute leader.

### 1.1 Scope

This research work builds on a case study with 25 domestic and international design students participating in the pre-diploma course of twelve weeks duration. The course contains a mixture of lectures, plenary discussions, tutoring, student’s own exploration and written reflections for plenary presentations. Depending of each student’s line of interest, each student was encouraged to develop their diploma programme by consistently framing and reframing his or her written formulations, and - in parallel with this - asked to give feedback by grades at six different milestones during three phases. The final evaluation and approval of the presented projects was based on both oral presentations and written project descriptions.

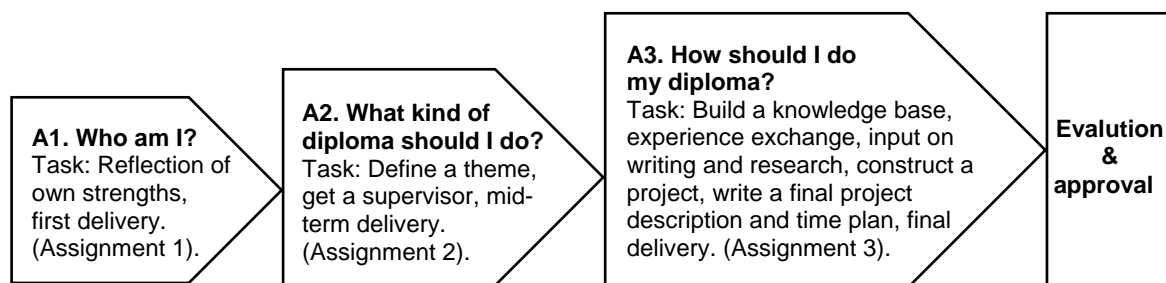


Figure 1. Course structure; the three main phases of the pre-diploma course

As figure 1 indicates, our course structure facilitates a successive determination process through three assignments, triggered by three keywords; *who - what - how*. The two last stages correlates to how Valkenburg and Dorst in 2011 introduced the model that combined abductive reasoning with the concept of frames [4], describing the relation between ‘what’ and ‘how’. Our model correlates partly with this theory, but is lacking a mental trigger towards a divergent, holistic view, to ensure the encompassment of ethical and moral considerations throughout the creation process towards the final diploma description.

In 2011 Skulberg introduced the concept of mental scaling to the area of design, by suggesting that students hold different personal characteristics - or student capability parameters - that influence how a certain student will execute a given design process [5]. Mental scaling determines how mental fluctuations between meta-level (abstraction through holistic view), and physicality level (concretization through fragmented view) evolve and influence the mental journey from which a design solution evolve. By asking “why”, a mental shift through a divergent view is provoked, as it turns the focus towards meta-level, containing ethics, values, morality, existence and stances. By

asking “how”, a fragmented view is triggered, forcing a convergent view towards physicality, solutions, object and details.

## 1.2 Research question

Our research question is: by initiating feedback from the students during the pre-diploma course based on their level of insight and reflection of their own diploma task, what kind of information can we extract from this qualitative survey? Secondly, how can this information assist us in building new knowledge of the mental capabilities required to develop and frame a robust diploma project?

## 1.3 Research methodology

In this case study, our ambition has been to facilitate a statistic survey given to the students in order to register each students' individual level of mental 'preparedness' for the diploma assignment. From our point of view, this preparation requires a certain level of consciousness, reflection and awareness of the scope of the diploma project, while being in the process of framing and reframing the assignment. Our main tool has been the registration of a combination of qualitative and quantitative data in the survey. The main motivation for presenting the survey to the student group was to build an understanding of how a progression of the mental state of mind of the student group as a whole will describe a convergent tendency during the course period, and by that determining if and how our facilitation of the framing process has been successful.

## 2 THE SURVEY

The survey was presented to the students the first day of the course, and all students were asked to individually register one value at six milestones during the course, while the class was assembled in plenary sessions. On a scale from 1 to 9, grade 1 represents no control or understanding of the diploma project, while grade 9 represents full control and understanding of the diploma project. If a student were not present, no grade was registered at that specific date, only represented by a dash in the table.

*Table 1. Overview of students, gender, nationality, previous affiliation, discipline and grades*

Student	Gender	Nationality	Prev. affiliation	Discipline	22.08.	05.09.	12.09.	03.10.	24.10.	06.11.
1	F	Norway	AHO Oslo	IX	1	-	-	4,5	5	7
2	F	Norway	BA UiO,HiSN	IX	1	3	3	-	5	7
3	M	Norway	AHO Oslo	IX	1	3-5	-	5	4	8
4	F	Norway	AHO Oslo	IX	1	2	2	2	-	7
5	F	USA	BA Washington	IX	1	2	3	-	7	7
6	M	Brazil	BA Sao Paulo	SD+SOD	1	3	6	8	7	7
7	F	Norway	BA HiOA	IX	1	4,5	4,5	7	-	6
8	F	Norway	AHO Oslo	IX	1	4	4	5	-	8
9	F	China	BA Jiaotong	IX	-	4,5	4,5	6,5	7,5	8
10	F	Iran	BA Islamic Azad	SOD + ID	1	7	7	8	-	8
11	F	Norway	AHO Oslo	IX	1	1	2	4	3,5	6
12	M	India	BA Calicut	ID + SOD	1	3	4	-	4	7
13	F	Norway	AHO Oslo	IX	1	1	3	5	6	7
14	F	Norway	AHO Oslo	IX	1	-	3,5	5,5	6	7
15	M	Norway	AHO + NTNU	IX	1	3	3	5	-	7
16	M	UK	BA York	IX + SOD	1	-	3,5	5,5	6	7
17	M	Sweden	AHO Oslo	IX	1	-	3	3	3,5	6
18	F	Germany	HFBK Hamburg	SD	1	-	5	-	6	7
19	F	Norway	AHO Oslo	IX	1	3	3	8	8	8
20	M	Norway	AHO Oslo	IX	1	2	2	5	4	7
21	M	Russia	AHO Oslo	ID	1	3	5	-	4	8
22	F	Norway	GD Kingston U.	IX	1	3	3	-	5	7
23	M	Norway	AHO Oslo	ID+SD	-	4	4	7	7,5	8
24	F	Finland	BA HiOA	IX	1	4	4	-	-	6
25	F	Poland	AHO Oslo	ID	1	3	3	-	4	8

As table 1 indicates, from a total of 25 students, 14 of these were domestic (Norwegian), while the rest were international students. The gender distribution was 16 female / 9 male. All students were asked to indicate which discipline of our master programme curriculum their diploma would encompass. The code IX means Interaction Design, ID means Industrial Design, SD means Service Design, and SOD means Systems Oriented Design. A vast majority - 17 of the students - chose interaction design as discipline, while two chose industrial design, one chose service design, while the rest registered different combinations of disciplines.

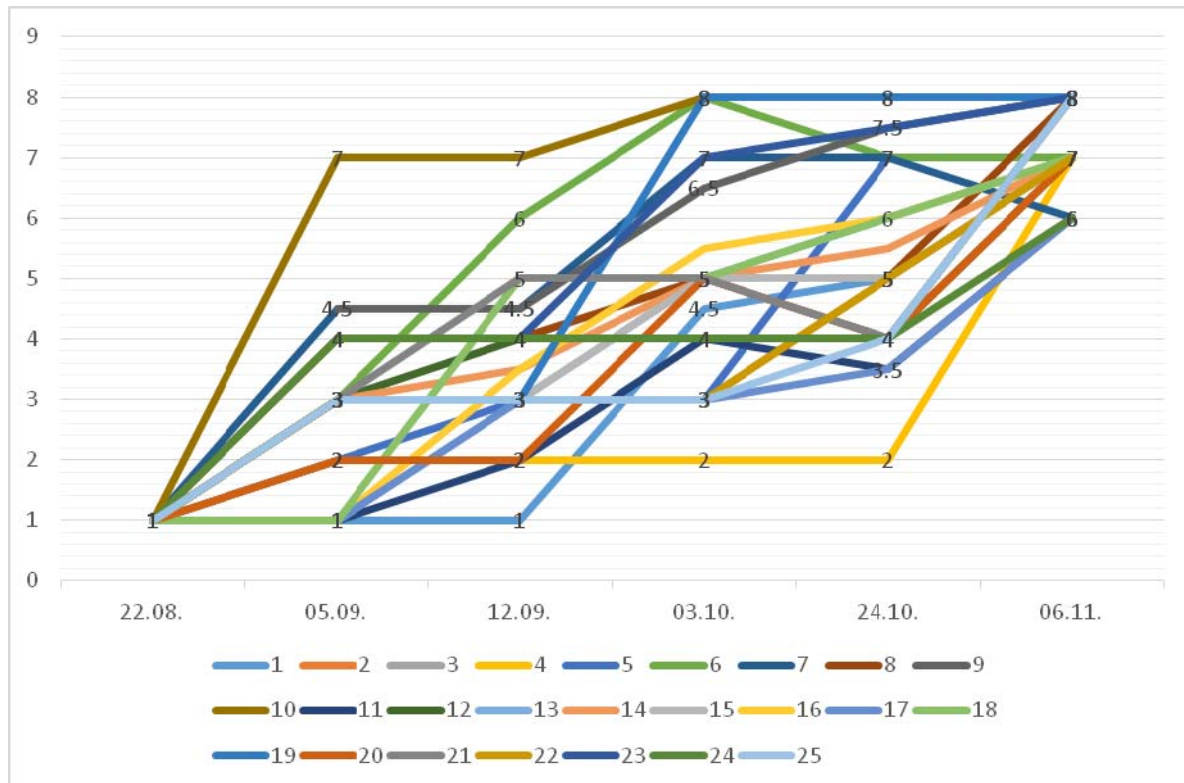


Figure 2. Distribution of grades through the registration period

## 2.1 Findings

When observing the tendency of values based on the six milestones, a general increase of values is observed according to table 1 and figure 1, confirming that there has been a successive building of consciousness on the task during the course period of twelve weeks. On the starting day, all students – except two who were not present – registered value ‘1’. At the final milestone, all students gave grades in the span between ‘6’ and ‘8’. One of the students - number 10 – breaks the common pattern, by registering a distinctively higher value than the rest in the second milestone. This is caused by the fact that this student made an early confirmation with an external company as partner, thus establishing a common understanding of the content of the diploma assignment, and how it should be executed. None of the students registered the highest score - 9 - during the survey, indicating that none of the students really felt that they accomplished a full understanding or control of the implications of the design project as a whole. In four cases, pairs of students decided to cooperate together in design teams, totalling eight students, and all of these signed up for interaction design projects. None of these students had initially decided to cooperate, so these connections emerged during the course period.

## 2.2 Diploma project categories

While observing how the course evolved, we found that four different project constellations emerged during the convergent process of framing the diploma project:

- Individual student (self-framed project description)
- Student + student (design team, self-framed project description)
- Student + external partner (assignment framed in cooperation)
- Student + student + external partner (design team, assignment framed in cooperation)

We believe that this diversity of four different project constellations in combination with four different professional disciplines will finally challenge how the diploma evaluation committee will respond to the different points of views that these project descriptions most likely will be based on.

### 2.3 Design teams

As mentioned, one of the design teams chose to co-operate with an external business partner. In design teams, the ability to converge towards consistency is challenged, described by Valkenburg [6]. In the case where two students establish a design team, we also acknowledge that co-operation projects consisting of two students or more must be based on a fundamentally positive, personal chemistry. When committing into being part of a design team, the ability to discuss and negotiate is of significant importance [7]. The importance of negotiation challenges each student's ability to establish a shared vision of the project theme and its direction, and to strive for a common understanding of the goal of the project.

## 3 CONCLUSIONS

It seems very clear that the discussions each students had with their main and secondary tutor through the semester has contributed positively in framing their design project. These dialogues have strengthened the student's awareness of the scope of the diploma assignment, and have been of significant importance in the process of building a relevant scope correlating with each student's line of interest.

An overall observation is that the general increase in values through the diagram in figure 1 gives an indication of the successive building of consciousness around task that the pre-diploma course intentionally catered for, indicating that the level of mental preparedness during the course has increased, even though none of the students registered highest value - 9 - during the registrations. It also seems that the process of stimulating reflection throughout the course has been fruitful and relevant for the students during the process towards the final formulation of the project description. We suggest that a thorough and successive formulation of a design project require a minimum level of reflection in the search for control and holistic understanding of the scope of the design project. In order to obtain this holistic understanding, we believe that a minimum level of mental fluctuation is required, embracing both a meta-level implying values and stances, as well as an operational level implying methods, tools, and concrete deliverables. Based on the fact that none of the students registered maximum values during the course, it might seem that we should have made even stronger efforts in encouraging the students into the process of mental fluctuations. These fluctuations seems to stimulate the student's ability to reflect and think towards a meta-level as well as towards a concrete formulation of the diploma project, and both these aspects seems to be essential in order to grasp the complexity which a design task on graduation level should contain.

## 4 DISCUSSION AND REFLECTIONS

Our research support the concept of mental scaling, as we acknowledge that the span between abstraction through a holistic view and concretization through a fragmented view supports the students during the process of successively framing the scope of the diploma task. From our experience, in order to succeed in framing and describing the assignment, two opposite mental mindsets are required: The act of thinking both divergently towards abstraction through a holistic view, and convergent towards concretization through a fragmented view - which combined - will trigger the phenomenon mental fluctuation.

While having the ambition to get insight into each student's level of mental preparedness for the diploma assignment, this is the first time the students in our pre-diploma course has been utilised as a statistic resource in a survey for a case study, in order to build generative awareness and insight into the mental journey that the diploma assignment constitutes.

Relating to the four design team typologies, Valkenburg found that the quality of a design team's project is corresponding with the number of iterations of the project framing [6]. When evaluating the diploma briefs of our pre-diploma course, we argue that this relation not only applies to the design teams, but also for the individual project descriptions, where each student execute the same process, but in an individual mode. In their study, Møller and Hansen found that high-grade students carried out frequent revision of the frame, while low-grade students only sporadically carried out revisions [8]. This picture correlates with our view, as we see that the most capable of our students with robust

and thorough project descriptions had made the most frequent revisions throughout the pre-diploma course period. However, from our experience, the act of iterating does not guarantee any improvement in quality of the project description.

One weakness of our survey is that because of sporadically absence by some students at some of the milestones during the course, the registrations for some of the students suffers from a lack of continuity. As an example, three of the students were absent during two milestones. This leads to a reduced validity of student's registration, thus weakening the consistency of the survey.

From our experience, it seems that several implications emerge when allowing students into co-operation with external partners. The student seem to miss parts of the often fruitful process of individual reflecting and successively determination of what to do in the diploma, since the external partner usually at an early stage has a rather clear intention for the cooperation, and a strong opinion on the task which they provide to the student. The company often takes the initiative of formulating and determining what the student is going to work with, implicating that the student has less degree of self-determination during the formulation of the design project. In this case, our challenge is to encourage the student to speak up, and confront the partner with the fact that a diploma should not be just an assignment, but rather describe the design challenge in a broad, societal perspective, and to express the need for encapsulating a holistic view on what mission the diploma student is taking on. In this case, our challenge is to stimulate the student to bring forward a strong opinion on framing the task. On the other hand, the student is likely to achieve a valuable experience from real life industry when engaging in co-operation with external partner.

## 5 FUTURE PRACTICE

When planning the next future pre-diploma course, it seems that we should introduce the mental trigger-word "why" to the students, in order to provoke a more divergent mindset in the initial phase of the course. As societal needs and issues on a larger scale should be raised through a more holistic view, the stimulation of a stronger conceptual reasoning behind the project description could be achieved.

When admitting students into the co-operation with external business partners, we should more strongly emphasise the importance of facilitating the student into determining and framing of the scope of the assignment, in order to bridge the gap between corporate needs, and our pedagogical considerations that are important in developing essential skills for our graduates.

Since the pre-diploma course only focuses on preparation and framing the scope and brief, the final evaluation of the course focuses both on the process as well as the deliverables from the course. The ultimate insight into how the preparation for diploma is successful or not, would be to evaluate the outcome of the diploma assignment itself, which is executed the following semester, while this paper was written. Therefore, the whole and final insight into how the design briefs are succeeding in strong and robust diploma projects are yet to be seen, and a definite confirmation of the quality of the course plan will not be evidenced before the diploma is completed - a half year after the pre-diploma course was completed.

## REFERENCES

- [1] Schön, D. A., "Problems, frames and perspectives on designing". *Des. Stud.*, vol. 5, no. 3, 1984.
- [2] Schön, D. A. and Rein, M., *Frame Reflections*. New York: Basic Books, 1994.
- [3] Christian, H., "Creativity in Design", TU Delft, 1992.
- [4] Valkenburg, R. and Dorst, K., "The reflective practice of design teams", *Des. Stud.* Vol. 19, no. 3, pp. 249-271. 1998.
- [5] Skulberg, H., Exploring mental scaling as source for creativity during the design process. In *Proceeding of E&PDE 2011, The 13<sup>th</sup> International Conference on Engineering and Product Design Education*, London, September 2011, pp. 160-165 (The Design Society).
- [6] Valkenburg, R., "The reflective practice in design teams", TU Delft, 2000.
- [7] Hey, J. H. G., Joyce, C. K. and Beckman, S. L., "Framing innovation: negotiating shared frames during early design phases", *J. Des. Res.*, vol. 6, p. 79, 2007.
- [8] Møller, L. and Hansen, P. K., "Making Students' Frames Explicit" in *DS 83: Proceedings of the 18<sup>th</sup> International Conference on Engineering and Product Design Education (E&PDE16)*. *Design Education: Collaboration and Cross-Disciplinarily, Aalborg, Denmark, 8<sup>th</sup>-9<sup>th</sup> September, 2016*.