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# THE SUMMER DESIGN OFFICE: A WORK-LEARNING EXPERIENCE FOR INDUSTRIAL DESIGN STUDENTS

**Cecilie VATN, Bjørn BAGGERUD and Jon Herman RISMOEN**
NTNU, Norway

**ABSTRACT**
The Summer Design Office (SDO) is cooperation between Bedriftsforbundet, Innovation Norway, and the Norwegian University of Science and Technology (NTNU) which was initiated in 2006. The aim of the office is to increase the use of design as a competitive advantage within Norwegian Small-Medium Enterprises (SMEs). The means of achieving this goal is by using design students to develop a conceptual design for the participating businesses. [14]
A study has been conducted which attempts to answer the following questions:

- What is possible to learn by work, according to the pedagogical literature?
- Is the potential for learning utilized in the SDO?
- Are there changes that could improve students' learning within the SDO?

This study contains a literature study of learning by work and an analysis of the SDO in relation to this, with a subsequent discussion. In addition, a survey among the students has been used in this work.
The following paper has a short description of the SDO, a review of important literature, a discussion against these theories, and results from the survey with suggestions for improvements. Finally, areas that have the potential for further exploration within this specific topic and the literature in general are highlighted.

*Keywords: Summer design office, design students, learning through work, SMEs, industrial design, reflection*

## 1 INTRODUCTION: WHAT IS THE SUMMER DESIGN OFFICE (SDO)?

Each summer, the SDO employs 15 Industrial Design Master's Students who work in three offices for a period of seven weeks. During this period, the students establish the office, perform the work and develop a design concept for a total of 24 small- to medium-sized companies (SMEs), which is done for what the companies consider to be a reasonable fee. These give both the SMEs the chance to use designers to improve their products and the students some relevant work experience. Since many of the Industrial Design Master's Students in Norway have been employed by this office after 2006, its educational value has become important for the entire design industry.
The long-term goal of the SDO is to increase Norway's innovation output, making Norwegian enterprises more aware of design and the value it can add to their business, which can be a valuable source for innovation and a competitive advantage [14]. As a result, the office's location changes from year to year, aiming to operate out of all 19 provinces in Norway before going back to an area again. The reason for this arrangement is to maximize the geographical spread of the project, ensuring that as many areas as possible come into contact with the office and its designers.

## 2 THE THEORETICAL FRAMEWORK

### 2.1 A need for change

Throughout the last few decades, there has been a shift in the economy (globalization, diversification, etc.) which in turn has changed the nature of working. Industries have a quicker pace for innovation, knowledge has become a much more important factor than ever before, while the differences between industries have been reduced and a higher value has been placed on information technology. All these changes have forced a revision of the educational system to occur [8][13][12]. In order to cope with this new working environment, the workforce of today needs to be built from generalists. [1] This shift

calls for students to gain a wider experience base, to work in teams across various fields, expand their knowledge through social interaction, learn the use of information technology and build commercial awareness [2][15][12]. It is clear that students not only need to be taught theoretically to acquire a complete education, but also need to deal with real world practices to fully comprehend and connect these different areas. The more traditional model of the 1970s and 80s, with the view that theory can be taught separately from the context in which it will be applied, is no longer acceptable [8][9].

### 2.2 Linking education and work

To link the educational and working worlds, both "vertical development" and "horizontal development" need to be connected. "Vertical development", or intellectual development, refers to the formal learning often done in school, where the student is guided through a progressive line of different learning levels with an increasing difficulty. "Horizontal development" takes place in a much more informal manner, in situations in which a person moves from various contexts on the same level [9]. This "horizontal development" can be created in two different ways. The first is by *boundary crossing*, which is where a person engages in new contexts that call for different knowledge and skills, while the second is through *polycontextual situations*, in which at any given time, one simultaneously engages in multiple activities [8][3]. "Horizontal development" is important since it has been demonstrated that moving from different contexts enhances the transfer of skills, thereby allowing the skills to be used and understood in different settings (Watts, 2006). This underscores the importance of students simultaneously experiencing school and work situations. According to Smith and Betts [16], there are three different ways to connect learning and work. We have *learning about work*, *learning at work* and *learning through work*, in which participation and reflection yields a full learning experience [16]. This could be organized in various ways and is discussed by many [5][7][10][11][13][12][4]. An important distinction here is that doing never formally becomes learning if there has not been a process of systematically guided reflection. Therefore, the quality of learning is decided by the quality of reflection, not by the quality of the work experience [16]. Learning will never be complete if the work experience is not reflected both on and in the sense of being linked to students' theoretical knowledge [13].

### 2.3 How work-related learning can be done in an optimal way

To achieve such a guided reflection and theoretical linkage, there needs to be a bond established between education and work. Many educational institutions have already taken this into account, creating work-related learning as an integral part of their educational platform. This has been accomplished by introducing "work-based learning" (learning that takes place through internships, practical placements, work-oriented projects, etc.) and by further easing the transition between work and school life by using newer forms of learning such as problem solving (a work form that simulates working life) [9][12].

There are various ways of designing a program for how student learning should be assisted in a work-related learning experience, which demands diverse ways of linking work and education. As shown in Table 1, there are five theoretical models for partnering industry and education with different levels of involvement, structure and guidance. Only the latter two: *the Work Process Model* and *the Connective Model* have a profound educational effect because they focus on reflection and coaching as an intricate part of the learning experience. Out of these two, the connective model goes the furthest by also emphasizing polycontextuality, which combines both vertical and horizontal development [8][9].

*Table 1- A typology of work experience - Griffiths and Guile 2004[8], Figure 1, p. 20*

| MODEL OF WORK EXPERIENCE | Traditional Model 1 | Experiential Model 2 | Generic Model 3 | Work Process Model 4 | Connective Model 5 |
|---|---|---|---|---|---|
| **A. Purpose of work experience** | 'Bridge' to work | 'Co-development' between education and work | Key skill/competence assessment | 'Attunement' to work environment | 'Reflexivity' |
| **B. Assumption about learning and development** | Adaption | Adaption and self-awareness | Self-management | Adjust and transfer | Vertical and horizontal development |
| **C. Practice of work experience** | Managing tasks and instructions | Managing contributions<br><br>Plus recording experiences | Managing action-plan and learning outcomes<br><br>Plus managing situations | Managing work processes, relationships and customers<br><br>Plus adding value for employer and supporting employability | Developing the connective practices<br><br>Plus 'entrepreneurial ability' |
| **D. Management of work experience** | Supervision | Arms-length supervision | Facilitation | Coaching | Developing and resituating learning |
| **E. Role of education and training provider** | *Provide:* formal preparation programme | *Facilitate:* briefing for and de-briefing of work experience | *Build:* portfolio of achievements | *Support:* reflection-in and on-action | *Develop:* partnerships with workplaces to create environments for learning |
| **F. Outcome of work experience** | Skill acquisition Knowledge of 'work readiness' | Economic and industrial awareness | Assessed learning outcomes | System thinking | Polycontextual and connective skills |

### 2.4 The interests and qualities of all the parties

The complexity of the work and education mix calls for an examination of work-related learning from the perspective of the parties involved. This includes the students, the educational staff, the organizations that employ the students as well as the viewpoint of society and the educational system, so as to ensure that all the stakeholders' views have been taken into consideration [12]. However, how to balance the needs of the educational institutions and the participating businesses is an ongoing topic of debate. The optimal solution is said to be when there is the potential for a commercial product that the business can realize, while the students are academically challenged and allowed the freedom to be creative. The initial problem occurs when one of the parties feels that their interests are not being upheld in the collaboration [2].

### 2.5 Skills that should be learned

One of the most important benefits that the students attain from their working experience is the skills. As defined by the Qualifications and Curriculum Development Agency (QCDA), the key skills are:
*"Skills that are commonly needed for success in a range of activities in education and training, work and life in general."*
More specifically, this means *applying numbers, communication, and the ability to improve one's learning and performance by using information and communication technology, problem solving* and *teamwork.*

## 3 THE SURVEY DESIGN

This study was designed to establish a greater understanding in regard to the topic of learning within the specific context of the SDO. The survey was based on a standard format of questions developed from a review of previous research, supplemented with more specific questions connected to the unique situation that the SDO represents, thus resulting in two types of questions. Firstly, a number of statement questions were designed to give the students the chance to rate options following a Likert scale ranging from nothing (denoted by 1) to much (denoted by 4). Secondly, a range of open-ended questions were developed that allowed the students to freely give their answers to ensure in-depth insight into the students thoughts without leading their answers, while also uncovering unique thoughts and opinions.

## 4 FINDINGS

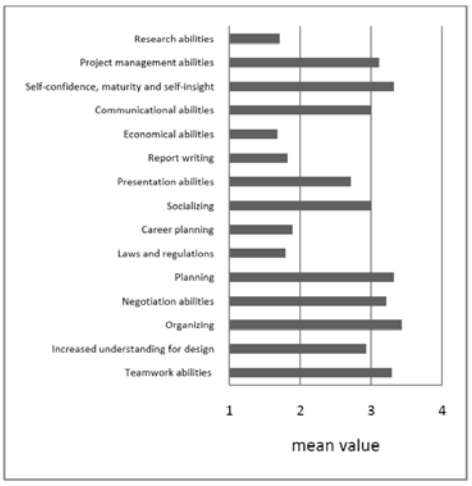
The findings are based on a survey that was sent out to all of the 54 previously employed students in the fall of 2009. A sample of 28 usable responses was obtained, yielding a response rate of 52 percent.

### 4.1 Why the students applied for this job


We found that *learning* and *work experience* are clearly the two most important elements as to why the students choose the SDO as their workplace. This demonstrates how valuable the SDO is for the students in terms of their evolvement as designers and how important it is to keep the level of work experience and learning high to ensure that the students maintain their interest in this type of work.

*Figure 1. Why the students applied for a position with the SDO*

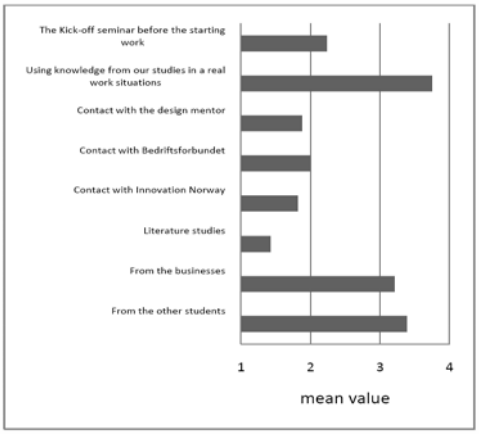
### 4.2 What the students learned




The amount of learning accomplished as a result of this work experience was at a high level, with the students ranking the general learning at a mean value of 3.4 out of a maximum of 4. The fact that the students achieved such a profound amount of learning is an important finding when seen in light of the motivational factor that learning is for the students when they applied for this job. This means that the students' wishes are being fulfilled. Out of the 15 skills addressed, 10 were developed to a very high level, covering a range of areas from more social skills to becoming better organized. From this list, we can see that the students improved in most of the areas that they felt were missing from their education except for their economic abilities.

*Figure 2. Areas of learning and development during the SDO*

### 4.3 How the students learned




The learning was mostly done by having contact between the businesses and students, as well as by acquiring knowledge in a real work situation as shown in Figure 3. By contrast, the entire steering committee, the kickoff seminar and the literature studies had very little to do with the students' learning.

These findings are not surprising since they reflect who the students interacted with the most throughout their work experience. The students work in teams and were in constant contact with the businesses, so it makes sense that these groups should have a profound impact on their learning.

*Figure 3. How the students learned and developed skills*

### 4.4 The student and work match

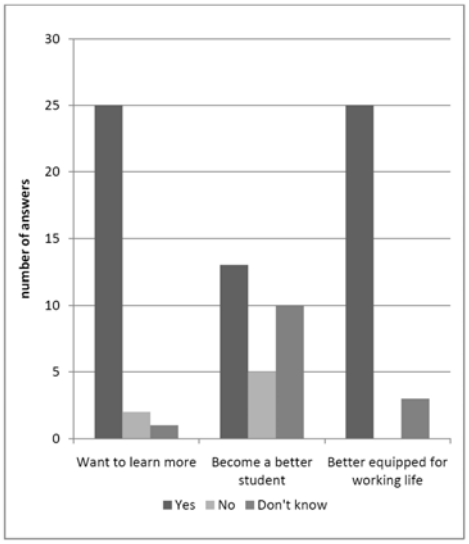
All but one student felt they were suited for this type of work because of their extensive background in project-based teamwork. They also saw clear similarities between their education and this work experience, thus allowing them to build on a familiar foundation. Nonetheless, there were many areas that they felt were lacking in their education to prepare them for their work experience. Those most commonly mentioned were *project management* (setting early and clear boundaries, leadership and

coordination), *realization of projects* (technical insight, economy and production) and *communication with external partners*.

### 4.5 The students reflection over their work experience

When it comes to the students' reflection over their work experience, almost all the students stated that they had reflected. However, when asked why, it became clear that there was no structure or guidance on reflection for most of the participants. Only two of the participants reflected more deeply because they had to deliver reports or present their work to external partners. The most commonly stated reason for reflecting was the fact that this was a new experience and it was therefore natural to reflect upon it.

### 4.6 The results of the students learning




As a result of their work experience, the students felt better equipped for the working world as revealed in Figure 4, with all but three students answering yes. On the other hand, there was less of a consensus among the students on whether this work experience had made them better students or not. Here, more students answered "I don't know" and "no" than "yes", making it difficult to assess the value of the work experience for the students' further studies.

Even though the students were inconclusive concerning the aspect of becoming better students, they still came out of the experience wanting to learn more, with 25 students stating an unqualified yes. The reason for this increased desire to learn was because the students either discovered they lacked skills in relevant areas or were introduced to new and more exciting fields.

*Figure 4. What the students have gained from their experience*

### 4.7 Improvements to increase the learning level

The most commonly stated answer on how to improve the students' learning was to reduce their workload. The students felt that the high number of projects, with each student simultaneously working on four projects, and the fact that the businesses were poorly prepared left little time for an increased focus on learning. It also made it difficult for them to go deep enough into each project to learn more about the specific area of project realization. A few also felt that standard work material could be introduced for repetitive tasks to further assist in reducing the workload further such as report manuals, etc., which would remove unnecessary work. This, along with a reduction in projects, would free up time for elements to introduce increased learning such as reflection. Finally, to ease the transition between school and work, some of the students wanted an increased amount of contact with the design mentor, learning more about work through the kickoff seminar, in addition to obtaining more information on the participating businesses and an increased focus on how a design office should be run. These areas all target the elements the students felt were missing from their education to help prepare them for this work experience.

## 5 CONCLUSION

It is quite clear that the SDO has been an extremely valuable learning experience for the Norwegian Industrial Design Master's students, not only by gaining relevant work-related experience but also by developing a large set of important skills. This shows that even though their relevant work experience is very short and lacks a concentrated focus on learning, it has had an extremely positive effect on the students' development. In this case, a single employer also has a profound influence on the improvement of the entire Norwegian Industrial Design workforce because they are such a large student employer within this field. In particular, the high level of responsibility, the teamwork and the fact that they had to relate to such an extensive set of stakeholders meant that their teamwork, negotiation and project management abilities were increased to a higher extent than has been seen in other similar initiatives.

The depth of the learning also needs to be addressed. As previously mentioned, this can be improved by introducing learning goals, guided reflection and more supervision. However, since the literature in this area primarily covers work experiences organized by educational institutions, it is uncertain as to whether implementing learning activities in this type of setting will work. Even so, it is our opinion that the SDO and other similar work experiences look to introduce guided learning into the work experience because of the well documented benefits it has in formalizing and connecting learning to theory, which will ultimately make the students better suited for the working world.

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