INTERNATIONAL CONFERENCE ON ENGINEERING AND PRODUCT DESIGN EDUCATION
3 & 4 SEPTEMBER 2015, UNIVERSITY OF LOUGHBOROUGH, UK

MULTIPLE MEDIA STIMULUS IN PRODUCT DESIGN TEACHING: THE IMPORTANCE OF RICH MEDIA ENVIRONMENT

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ABSTRACT
This paper investigates how a rich media environment influence student's learning outcome within industrial design education. Through a case study focusing on a student project in product design, the prerequisites for learning outcome have been assessed, with the aim to improve our product design curriculum on undergraduate level. The student's intrinsic motivation for work seems dependent of the pedagogical inspiration and facilitation of media, methods and tools provided by the educators. Exposure to diverse combinations of specific learning media builds valuable stimulus for creativity. This paper explains in particular what kind of media that may influence positively to student's individual progression and learning outcome. In this setting, we acknowledge that multiple media stimulus becomes catalyst for building knowledge, skills and a certain designerly confidence. While being unexperienced students on undergraduate level, the exposure to new methods, tools and media seems crucial in order to build the necessary level of knowledge and self-awareness. The findings suggest that the facilitation of multiple media stimulus through a rich media environment may produce increased learning progression through the learning journey. The individual choice of these learning media seem to determine the specific outcome of each individual student's learning progression and the character and quality of each student's materialized submissions.

Keywords: Multiple media stimulus, rich media environment, learning outcome, facilitation, case study.

1 INTRODUCTION

As the design field develops away from physicality towards conceptualization and immaterial media on digital platforms, we acknowledge that a stronger emphasis on research on design methods is required, and this paper aims at bridging the gap between research and practice within the design field. We acknowledge the importance of teaching industrial design students efficient design methods in order to provide them with creative skills and practical abilities to develop relevant solutions for corporate use in industry. Today, a common comprehension is that the importance of design students' skills within product design is diminishing, while the value of interaction design and service design skills is considered to be strongly increasing. We also acknowledge that even though disciplines such as interaction design and service design are commonly facilitated through digital media, these disciplines are also in most cases dependent on facilitation through physicality. Physical products are still needed, and as a consequence of this, we support the idea of initially making design students able to build experience from investigation and experiments through basic product design assignments on foundation level, prior to more advanced disciplines such as interaction design and service design. It is commonly understood within creative disciplines that a rich media environment - in general - may support the outcome of creative processes. However, there is a limited amount of research in this field, and there is a need for stronger research on what kind of stimulus that enhances creativity in product design education in academia. This situation asks for a more in-depth study on how stimulus will influence the students' development through concrete product design assignments, and this study seems to be relevant for creating this insight from product design education at tertiary level.
There are several aspects that may influence learning environment. One could argue that even the physical learning space could be defined as part of a media environment, as space may influence how learning is executed [1, 2]. In addition to the influence gained from external media, student capability

parameters [3] are another aspect that determines to what extent an efficient learning journey is accomplished in academia. Parameters like mission, number of participants, age span and gender distribution in groups should be considered as relevant premises for creative thinking during product design assignments. However, due to the complexity that integrating learning space and student capability parameters would implicate, both these aspects are deliberately exempt from this study.

1.1 The scope and design case

The scope for this study is a design case where a group of industrial design students on foundation level were asked to develop three sets of cutlery: a disposable cutlery, an everyday cutlery, and a "fine" cutlery. Each set of cutlery was supposed to consist of a minimum of three elements; knife, spoon and fork. The students were supposed to document one of these sets of cutlery through computer drawings using 3D CAD SolidWorks software. As a starting point, the students were asked to investigate aesthetical expressions through exploration of individual materials. Furthermore, the students were encouraged to explore through individual design processes, and to individually choose the order of activities, different media exposure and optional working tools throughout their exercise.

1.2 Research methodology

Our research methodology has mainly been focusing on student behavior. Three different research tools were used in this study; observations of the tutoring sessions in the workshop and in the studio, photo documentation from the workshops and studio exhibition, and finally a written questionnaire.
Our research question was: What kind of media build valuable stimulus for creativity? Through the cutlery design project as case study, this study investigates in particular on what kind of media exposure that contributes positively to strengthen students' design process or generate new ideas.
Our hypothesis is that the combination of various kinds of stimulation from media will determine the outcome of each student's assignment, in terms of creative production of ideas and design solutions.

2 THE STUDY

The observations of students took place in different settings through the assignment. As part of the introduction to the cutlery design assignment, an initial workshop was carried out - figure 1 - with the aim to establish a certain awareness on the context and environments that a specific type of cutlery usually will be part of. In this workshop, existing cutlery was used in order to prepare the students for aesthetical assessments, where the students were encouraged to assess whether a given set of cutlery would suit a certain user setting or atmosphere. There are several advantages of this procedure: it stimulates the students' language and communication skills, and the tactile contact with physical artefacts builds experience and consciousness around both user behavior and common etiquette. Studying aesthetical and functional relations between each element of the cutlery adds to this insight.

Figure 1. Initial workshop

Facilitating the right mind-set for creative thinking [4] is crucial in design education. Our ambition was to create a stimulating environment for the students during the initial phase of the assignment, as base for a generative process enabling the students to develop ideas and concepts while 'swimming in inspiration'. In addition to facilitating the workshop, a series of initial, inspirational lectures were given, in order to build a basic knowledge about cutlery as phenomenon.

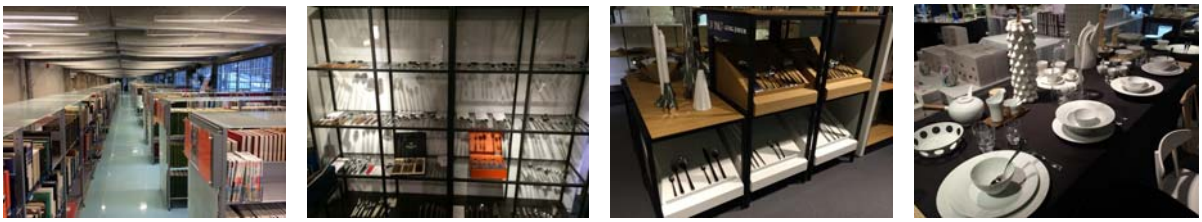

Figure 2. Sources of inspiration

The students were exposed to different media and situations - figure 2 - spanning from research using photo-documentation, excursions to domestic household stores, search for vintage cutlery with historic value, discussions with other students and teachers, initial research on user behaviour, internet search, developing product design specifications, searching relevant literature in library, tutoring, 2D concept sketching, 3D CAD tutorials as well as group reviews.

Figure 3. Pre-making stages – visionary mind-sets

The ability to make design representations is a vital skill in design process [5] and the ability to communicate visions for a new design solution is if paramount importance to product designers and this supports the idea of raising visually literate students [6]. As a consequence of this intention, efforts were made to develop visual communication skills during drawing exercises. Figure 3 presents photo-documentation produced in different situations from the research and the initial idea generation.

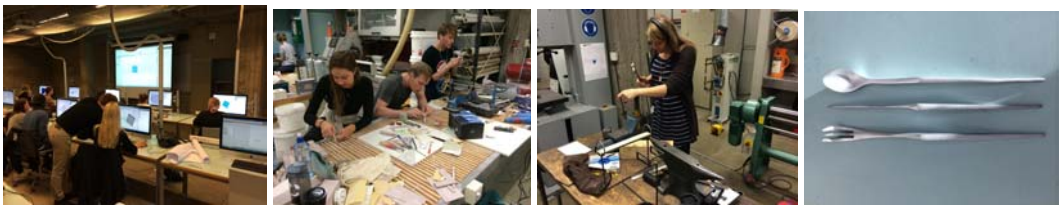

Figure 4. Diverse media environment - in the making, and example of final result

In a typical design process consisting of analysis phase, ideation phase, concept phase and detailing phase, different tools are used dependent on timing during the project. While the use of investigative sketches is typically reduced, the focus on sketch models and final presentation models increases during the process [7]. In order to stimulate the exploration through individual processes, we encouraged the students not to be bound by this pattern. Figure 4 exemplifies some of the diverse media environment that the students had access to during their assignment, including 3D computer lab where CAD drawings were made, plastic workshop and metal workshop. Finally, a presentation model is displayed in order to stress the importance of physicality being a paramount element of the creative journey, as the careful and generative processing and development of sketch models constitutes a significant stimulation as well as a required activity during the design process.

2.1 The Questionnaire

In order to obtain an in-depth understanding of the experiences that the students gained through the assignment, a questionnaire was separated into four different tables; (1) Statistics on distribution of gender and age, (2) Qualitative feedback from cutlery project, (3) Environmental stimulus overview, and (4) Description of other sources of inspiration / media / activities.

Table 1. Questionnaire - Statistics, distribution of gender and age

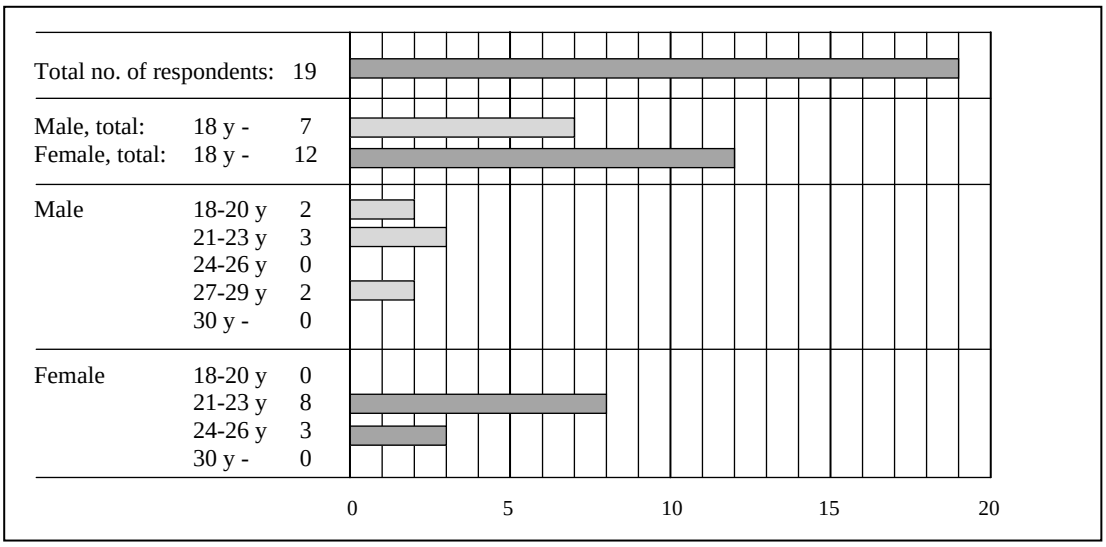

Table 1 indicates that from a total of 19 participating students, there were 7 male individuals, and 12 individual females. The major group of similar age was 8 females in the age group of 21-23 years.

Table 2. Questionnaire - Qualitative feedback from cutlery project, post-perspective view

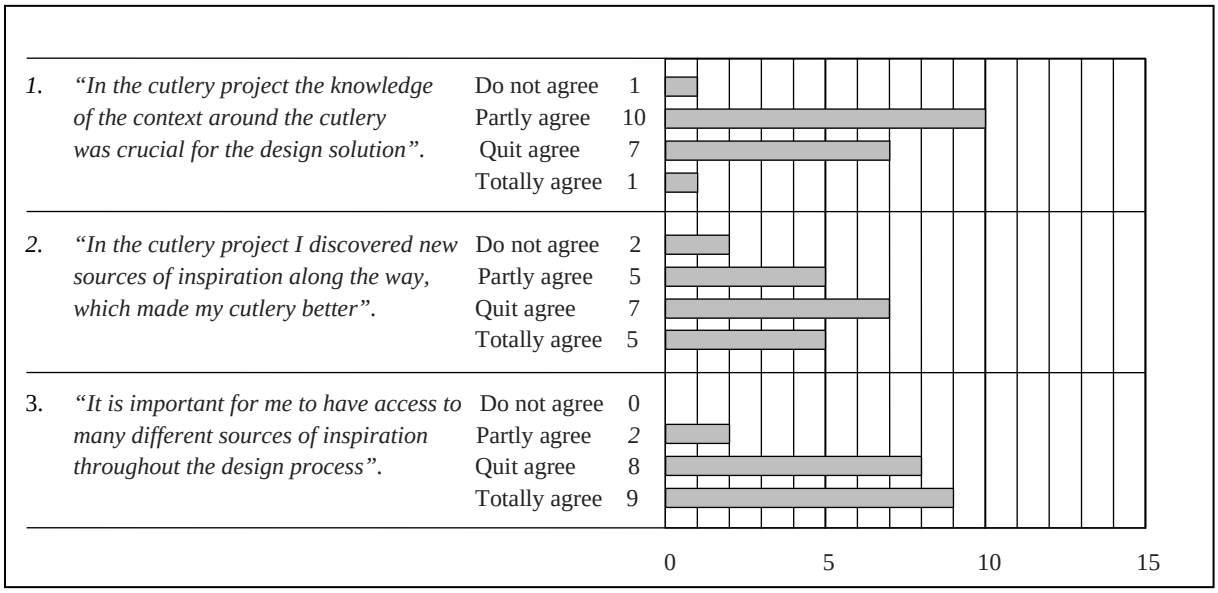

Table 2 provides feedback on how diverse media environment would influence the students' design processes. Q1 confirms that a major number of students - 17 of 19 – partly or quit agreed that knowledge of the context around the cutlery was crucial for the design solution. Q2 indicates that inspiration does not only occur as part of the initial research phase, but even more occurs along the way, during the project. In Q3, a vast majority of the students confirm the importance of having access to many different sources of inspiration throughout the design process. A rich media environment seems crucial for establishing a broad and diverse platform of inspirational resources necessary for producing a strong body of ideas and concepts, before going through a selective process.

In our search for detailed feedback from what students experienced as positive influence from environmental exposure, table 3 asked for specific sources of inspiration, media or activities that contributed positively to strengthen students' design process or generate new ideas, based on multiple choices. The questions were divided into four sub-categories: Human resources, physical / environmental resources, methodological resources / activities, and other activities / resources.

Table 3. Questionnaire – environmental stimulus overview, post-perspective view

"The following sources of inspiration / media / activities contributed positively to strengthen my design process or generate new ideas" (tick several boxes if necessary):

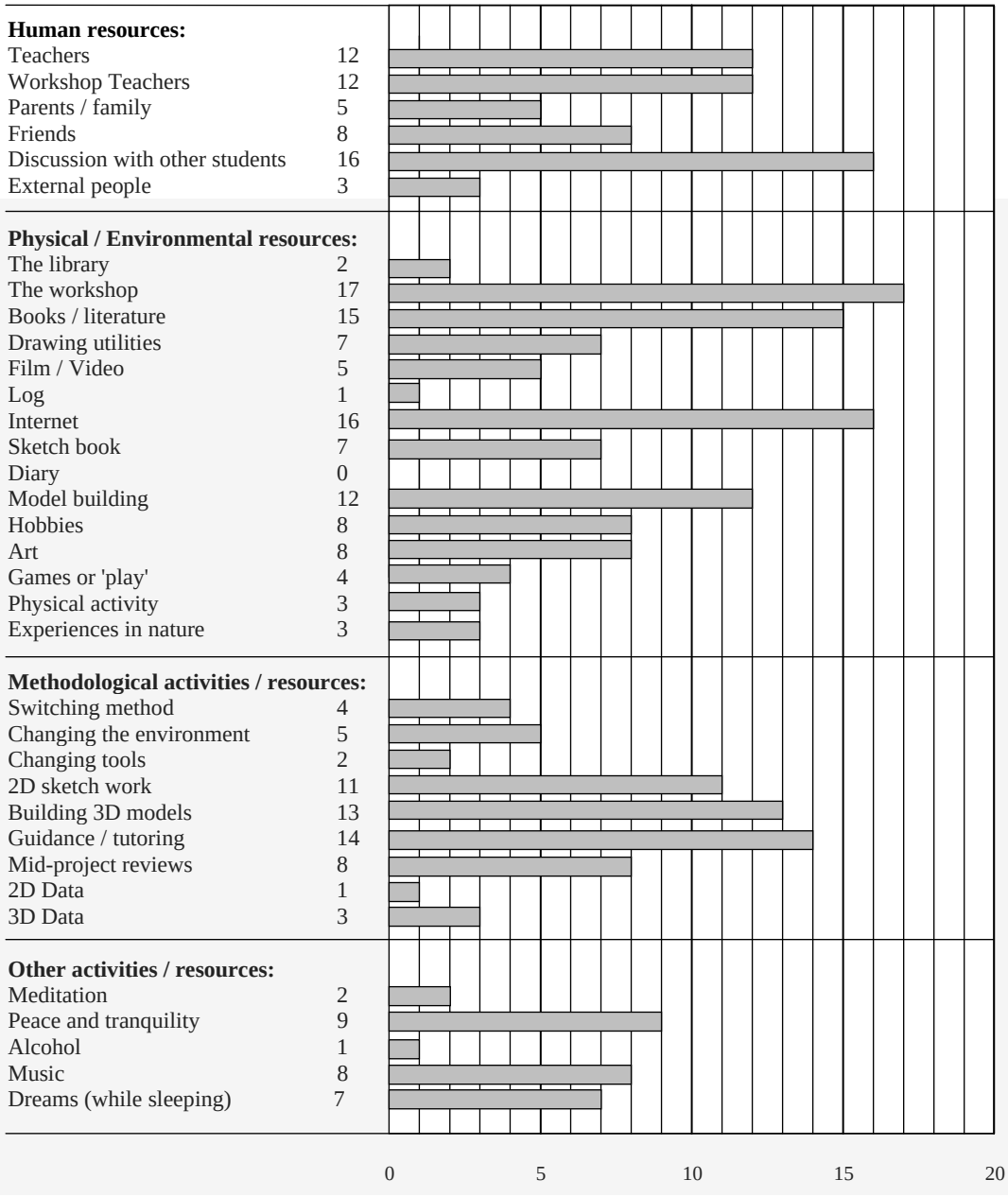

Table 3 of the questionnaire provides an extensive feedback from a broad scale of stimuli. Spanning from an abstract level consisting of physiological conditions (dreams etc.) to concrete media (sketch book etc.) this approach aimed at capturing a wide selection of influence from a broadest range of different media exposure. The students were enabled to tick several boxes if necessary.

• In the 'Human resources' category, especially discussion with other students and teachers as well as workshop teachers contributed positively.

• In the 'Physical / environmental resources' category, especially the workshop, books / literature, internet and model building contributed positively.

• In the 'Methodological activities / resources' category, especially the guidance / tutoring, building 3D models and 2D sketch work contributed positively.

• In the 'Other activities / resources' category, especially peace and tranquility, music and dreams (while sleeping) contributed positively.

Table 4. Questionnaire – Description of other sources of inspiration / media / activities

Please specify other sources of inspiration / media / activities:
- 'To explore the shops, see diversity and range of cutlery'
- 'Cartoons and animation'
- 'City tours, visiting shops'
- 'Joint projects stimulates community in class'
- 'Everything!'
- 'Taking a break from work, get distance and then come back with a slightly different angle / perspective'
- 'Relaxation from the project to gain new joy, spark and motivation

In order to collect qualitative feedback from strictly individual experiences during the design process, table 4 was added to accumulate personal notations. These answers are diverse, but reflect - amongst other - the positive experience from observing the range and diversity of existing cutlery.
One interesting aspect from the questionnaire is that only one student had actually written a personal log during the assignment. In a post-perspective view the students agreed that they would benefit from making a log, not only to get a track of their disposition of time, but also by making an over-view of their total exposure to different media, activities and inspirations that in total gained their process.

3 CONCLUSION AND REFLECTIONS

A major intention with the design project was to encourage the students into seeking different external stimulus through different media. One could argue that exposure to these different sources of stimulation is regarded as a methodological approach, and thereby complying with our initial intention to strengthen our research on design methodology in product design education on tertiary level.
It seems that our hypothesis mainly has been confirmed by the fact that the feedback gained from observations, photo-documentation and a written questionnaire indicate that exposure to a diverse range of media actually influences the outcome of creative processes. However, in order to build a more solid body of evidence, a larger group of students should be included in our study, and this would be relevant for a continuing, future study. A long-term study would contribute to this insight.
The importance of a rich media environment seems crucial for design students while being in creative mode and for us being tutors and researchers this study has been valuable as tool for producing new insight into what kind of stimulus that different media generate. It seems that the diversity of inspirational resources from a rich media environment is the key to obtain the necessary stimulus that students will most efficiently gain from in their creative processes through their learning journey.

REFERENCES

[1] Setola, B., Leurs B. (2014). The Wild, The Pub, The Attic and the Workplace: A Tool for negotiating a shared Vision on creative learning Spaces. *Proceedings of The 16th International Conference on Engineering and Product Design Education.*

[2] Cannon, D. & Utrainen, T. (2013). Spaces supporting creative design work. *Proceedings of The 15th International Conference on Engineering and Product Design Education Conference.*

[3] Skulberg, H. (2012). Strategies for stimulating Creativity in Design Education. *Proceedings of The 14th International Conference on Engineering and Product Design Education.*

[4] Lawson, Bryan. How Designers Think: The Design Process Demystified. *1980 (London: Architectural)*

[5] Babapour, M., Hiort af Ornäs, V., Rexfelt, O., Rahe, U. (2014). Media and representations in Product Design Education. *Proceedings of The 14th International Conference on Engineering and Product Design Education.*

[6] Eggink, W. (2011). Disruptive images: Stimulating creative Solutions by visualizing the Design Solution. *Proceeding of The 13th International Conference on Engineering and Product Design Education.*

[7] Sæter, E., Solberg, M. H., Sigurdjónsson, J., Boks, C. A Holistic View on Ideation and Visualisation Tools. *Proceeding of The 14th International Conference on Engineering and Product*