AROUND YOU: HOW DESIGNERS GET INSPIRED

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ABSTRACT
Searching for sources of inspiration during the design process is a widespread activity and it is considered as a crucial step for most designers, independent of the degree of expertise. However, little is known about what designers use as sources of inspiration, and how they process such information to generate ideas and solve design problems. Whereas previous investigations have shown both the positive and negative effects of using particular visual sources of inspiration, there is a lack of information on other types of stimuli designers might use during idea generation. This paper presents the results of a questionnaire on novice and expert designers' preferences regarding inspirational sources. Additionally, this study also encompasses both groups' selection of ideation methods for the generation of creative design solutions. Results show that whilst there are similarities between novices' and experts' responses, there are also clear differences in how they make use of available resources during idea generation. These findings unveil possible repercussions for design education regarding what (and how) designers search for as sources of inspiration.

Keywords: Sources of inspiration, external stimuli, ideation methods, novices and experts.

1 INTRODUCTION
It is well-known that when generating new ideas designers look for inspiration in a number of different sources [e.g. 1]. Novice and expert designers alike, working in teams or individually, rely on different stimuli to get inspiration for solving the design problems they face. Potential sources of inspiration can range from designers' internal representations to knowledge associated with available stimuli around them (images, objects, media, etc.) [2]. There are a number of reasons why designers actively search for inspiration, for instance: it is supposed to save time and effort; it is perceived as a stimulation of the creative process; and it basically broadens one's knowledge about past and present examples that can serve as potential triggers for new ideas and concepts. Allocating time to search for inspiration is an acknowledged practice in design methodology [3], which is carried out both in a systematic and/or more intuitive manners [4]. Inspirational sources take a prominent role in the creative process, especially during conceptual design phases [e.g. 5]. However, whilst designers' search for inspiration has often been recognised, there is no clear assemblage on the specific types of inspirational stimuli (including physical or pictorial examples, as well as 'creative' methods) designers reportedly use or prefer. Also, and more important, there is still no clear understanding of how designers make use of internal and external stimuli or how these influence idea generation. In fact, research has shown that exposing people to examples can have a *dual-effect* on design performance [6], with both creative [e.g. 7] as well as uncreative outcomes [e.g. 8]. Despite these opposing views on the use of stimuli during design idea generation and problem solving, important questions are still unanswered, for example: What are the specific inspirational sources designers search for? What differences can be observed between novices and expert designers on their preference for stimuli, as well as preferred idea generation methods? How much do designers value inspirational sources? How do designers transform available stimuli to produce innovative creative solutions?
Answering these questions will help us to gain a better understanding on *what* types of stimuli designers search for and *how* they retrieve and use stimuli during idea generation. Ultimately, in-depth knowledge about the influence of widely used inspirational stimuli, ought to enable (re)thinking how existing creativity methods could be improved and adjusted to the designers' needs. As a starting point to answer these questions, we conducted a questionnaire with novice and expert designers on 'sources of inspiration', including both favoured stimuli and methods for idea generation. Following a brief review on the use of sources of inspiration and idea generation methods in Section 2, we describe the set-up of the survey and the way we analysed the data in Sections 3 and 4, respectively. The paper goes on to present the results in Section 5, culminating in an overall discussion in Section 6, where we

analyse both novice's and expert designers' tendency to favour the use of particular stimuli and methods during idea generation. The paper finishes with concluding remarks in Section 7.

1.1 Sources of inspiration

Designers are typically known as having a preference for visual stimuli, [e.g. 9, 10], often searching for inspiration in pictorial representations [5]. However, visual stimuli are not the only sources of inspiration designers pursue [4]. Physical designs and its contexts, different phenomena, abstract concepts and designers' own memories have also found to be used as triggers for inspiration in different design related fields as triggers for inspiration [17, 5]. In the process of searching for inspiration, designers collect internal (mental imagery) and external stimuli in a case-based representation to be used at different occasions during the design process. This act of gathering possible sources of inspiration is generally seen as ubiquitous and indispensable, not only for solving immediate problems, but also for the development of design expertise [12]. Looking for inspiration is a continuous task, which can take place in the designer's mind, but also while interacting with the surroundings. In turn, inspiration search can happen intentionally, accidentally or unconsciously [4]. Looking for inspiration is then a moment of gathering information, which will potentially become design knowledge. In this sense, we can acknowledge a designer as "(…) an active organizer of design knowledge in a design context, who both effectively and affectingly manipulates a form [as well as shapes, colours, etc.], using various visual representations [as well as other stimuli], into a solution for the design problem at hand." [13]. Searching for inspiration, though, is not unique to designing activities. Areas where creativity is of major importance, like the visual arts (e.g. painting and sculpture), this is even more relevant. Also in scientific discovery, for instance, it is argued that creative ideas are always firmly planted on antecedents [14], and hence available stimuli.

The cognitive processes underlying the design performance are often considered a precedent-based type of reasoning [15]. In this sense, knowledge is understood as being continuously transformed, in order to generate new knowledge. According to Oxman and Oxman (1992), two cognitive strategies employed by designers are *refinement* and *adaptation*. Refinement is based on the elaboration of knowledge from abstract terms to particularization, which is achieved through a process of substituting previous representations with more specific ones. Adaptation consists of modifying previously acquired knowledge as a means to create new design solutions, in which interpretation has a major impact in how creative these new solutions are. Interestingly, *adaptation* as a cognitive strategy is perceived differently depending on the field of design. In fashion design, and specifically in knitwear design, the direct transfer of a precedent is not seen as a copy, but as a positive development from the original source of inspiration. Contrarily, in industrial and engineering design idea generation, for instance, repetition of (parts of) precedents are seen as a hindrance to innovative creative solutions [8, 16, 17].

1.2 Ideation methods

Design methodology literature provides a vast number of methods, tools and techniques aiming to support the different phases of the design process [e.g. 18, 19]. A number of methods exist which place emphasis on the idea generation, for instance integrated in literature on creative thinking approaches [e.g. 20]. Ideation methods have been broadly categorised into two main categories: *Intuitive* – e.g. Brainstorming, Checklists, Storyboarding, Synectics; and, *Logical* – e.g. TRIZ and Forward Steps [21]. Intuitive approaches, which despite its name include systematic procedures, are meant to break routines and overcome mental blocks. Logical approaches are largely based on existing available resources (e.g. TRIZ) and more scientific and engineering principles, to thoroughly decompose and analyse problems [21]. Until date, and in the study here presented, we have covered primarily *intuitive* idea generation methods, as those constitute the majority of techniques our participant audience (who filled in the questionnaires) is familiar with.

1.3 Reflection and expertise in design

Reflection is an essential activity humans can apply to flexibly adapt to different circumstances and changes in their environment. As no single strategy is universally suitable to all situations, the ability to acknowledge and adapt the own behaviour is an essential success factor in complex contexts such as design projects [22]. Whilst reflection can occur naturally, people are frequently prompted to reflect when they come across mismatches between what they expected and the actual situation. However,

reflection can also be taught and trained as a meta-cognitive skill. Educators use reflection as an integral part of experiential learning: students observe a role model undertaking a particular activity; afterwards they engage in the same activity, subsequently being encouraged to reflect on their approach regarding what went well and what could be improved [23]. Reflection in design practice has been discussed from two main standpoints: *reflection-in-action* and *reflection-on-action* [24]. Reflection-in-action describes how practitioners reflect while performing a particular action(s) without interrupting such process, and when it is still possible to interfere in the situation at hand. Reflection-on-action, in Schön's terminology, consists of a conscious analysis of one's strategies and actions carried out in the past [24]. Responses on the questionnaire here presented address the latter, by prompting the respondents to reflect on particular design circumstances or behaviours they might have come across in their design practice.

Reflection is an activity, which is closely connected to *expertise*. The development of expertise is a gradual process designers go through from their early design education until they reach particular levels of proficiency in their own field. However, this is not a swift process. Dreyfus and Dreyfus [25] developed a five-stage typology of expertise, describing the different levels in the acquisition of expertise from novice to expert status with defined characteristics on each stage. The main differences lie generally in two patterns of behaviour: a) *focus* – novice designers are problem-focused, whilst experts are solution-focused [26]; and b) *search patterns of information* – novice designers do not usually have a clear structure to guide them, whereas expert designers are prone to analyse extensively the problem and embark in an in-depth quest for all kinds of information that might help in following the process [27]. Generally speaking, once information is acquired, novices and experts tend to categorise it in different manners: novices organise information according to more superficial characteristics, whereas experts are able to analyse information according to many cases of solution principles they stored in the past [26, 29].

2 RESEARCH STUDY

2.1 Participants

As pointed out earlier, our aim was to find out novices' and expert designers' preferences regarding inspirational sources and methods used for idea generation. In order to answer these questions, we developed a questionnaire using NetQ software (NetQuestionnaires Nederland BV). The questionnaire was answered by: 103 industrial design engineering master students (i.e. novice designers); and 52 professional designers (i.e. expert designers), mainly from The Netherlands and Portugal.

2.2 Method

As we were aiming at collecting a large number of responses on the topic in a relatively fast and systematic fashion, questionnaires were chosen over other methods. The questionnaire, which was filled in online by the participants, took 15 minutes to be completed. In order to obtain additional information about particular topics, we occasionally added open questions. The questionnaire was divided into five sections, clustered under the following topics:

1. Individual background;
2. Sources of inspiration, internal and external stimuli;
3. Ideation methods;
4. Reflection on the design process;
5. Design teams.

The paper here presented focus on points 2, 3 and 4. Part 2 of the questionnaire (Sources of inspiration, internal and external stimuli), addressed the frequency and importance of designers' preferred inspirational sources, including the specific stimuli used, for instance: images, objects and text; as well as the phase of the design process where such precedents were perceived as being of higher benefit. Part 3 (Ideation methods) asked designers' preferences regarding 14 methods typically used in idea generation: Brainstorming, Function Analysis, Scenarios, Mind map, Checklists, Analogies, How To's, Storyboard, Metaphors, Collage, Context Mapping, Morphological Chart, Roleplaying and Synectics. The compilation of such methods was primarily based on an educational resource used at the Faculty of Industrial Design Engineering (at Delft University of Technology) entitled *Delft Design Guide* [30]. This book comprises a summarised overview on a range of prescriptive methods (derived from a number of literary sources), including methods for idea generation. Lastly, in part 4 (Reflection on the design process), participants were asked about their

perception of the influence of self-generated ideas/concepts, possible barriers arising from difficulties in generating creative results, and coping strategies used to overcome such hindrances. Consequently, reflection was analysed according the following aspects:

1. Attachment to initial ideas – tendency to keep a strong attachment to first idea(s) [31];
2. Stuckness – in this context, it pertains to one's awareness about being caught in just one possible solution idea [32];
3. Mental set – it refers to a tendency to follow the same approach to solve problems irrespectively of the situation [33];
4. Design fixation – an unconscious propensity to reuse parts/principles of previously seen examples [8].

2.3 Data analysis

The analysis of the questionnaire is divided into two parts: first, we analysed the responses within each group – i.e. within-group comparison; second, we analysed the responses between-groups – i.e. novices and experts. The analysis of results regarding *within-group* comparisons was computed using one-way analysis of variance (ANOVA). *Between-group* comparisons were analysed using Independent-Samples T-tests. Both analyses (within-group and between-groups) addressed the following topics: preferences for representation stimuli; preferences for ideation methods and awareness on the design process. Participants provided feedback on these topics using: 1 to 5 scales (e.g. 1 = never, 2 = rarely, 3 = sometimes, 4 = often and 5 = always); yes/no answers; multiple choice; and open answers.

3 RESULTS

3.1 Within-group analysis: novices and experts

This section presents the results from the within-group analysis on the preferences for representation stimuli, the preferences for ideation methods and reflections on the design process, separately describing the responses from novices and experts. .

3.1.1. Preferences for representation stimuli

The results demonstrate that novices use *images* more frequently than *objects* or *text* as stimuli to search for inspiration ($p < 0.01$, Figure 1). In addition, novices reported to use more frequently *objects* than *text* ($p < 0.01$, Figure 1). Expert designers on the other hand, seem to use *images* as often as they use *objects* (Figure 2). However, *text* as a source for inspiration is significantly less frequently used by experts when compared to the other two types of stimuli ($p < 0.001$, Figure 2).

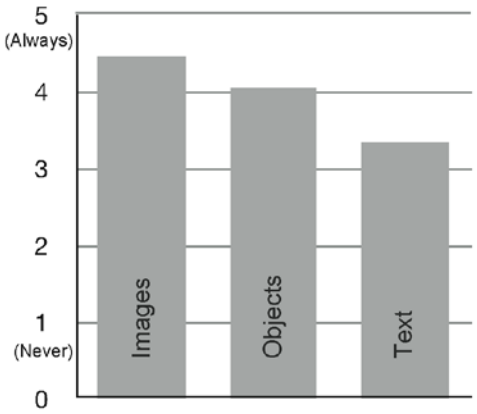

Figure 1. Novices: preferences on representation stimuli

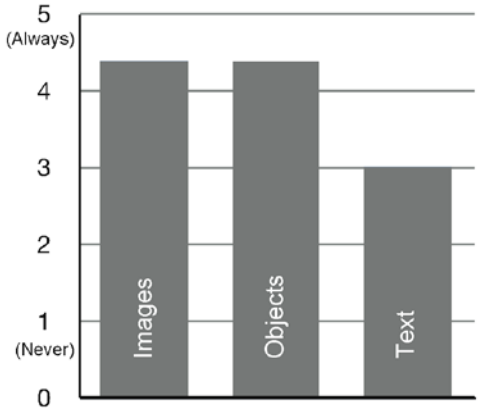

Figure 2. Experts: preferences on representation stimuli

3.1.2. Preferences for ideation methods

Brainstorming was the most recurrent choice made by novices, with significant difference against all other 13 methods ($p < 0.01$, Figure 3). Roleplaying, Morphological Chart and Synectics were reported as the least favourite ones, presenting significant differences against all other 11 methods ($p < 0.05$).

Results from the experts' responses show higher preference for three methods: Scenarios, Function Analysis and Brainstorming ($p < 0.05$, Figure 4). Similar to the novices' feedback, Brainstorming is reported as the most frequently used method during idea generation. The methods least appreciated by the experts were Synectics, Roleplaying, Morphological Chart, Context Mapping and Collage.

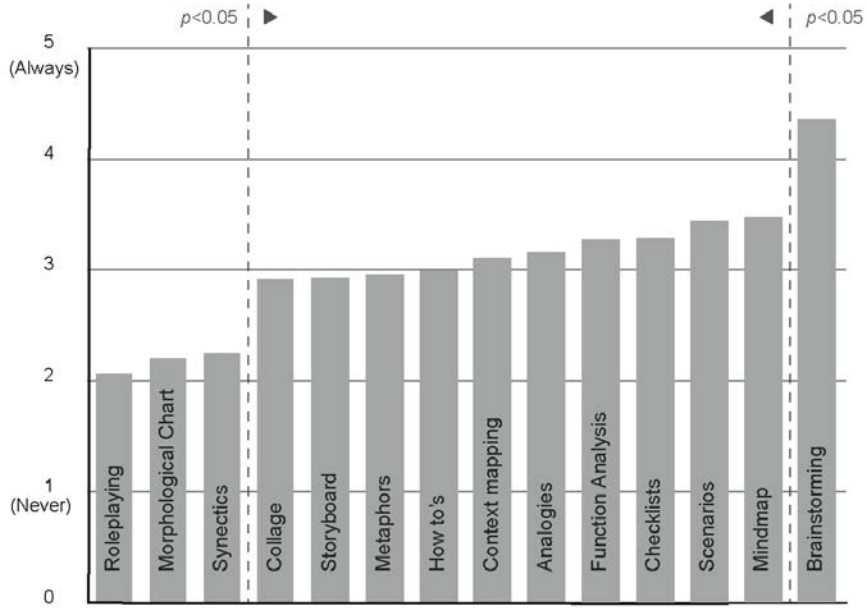

Figure 3. Novices: frequency of use of design methods

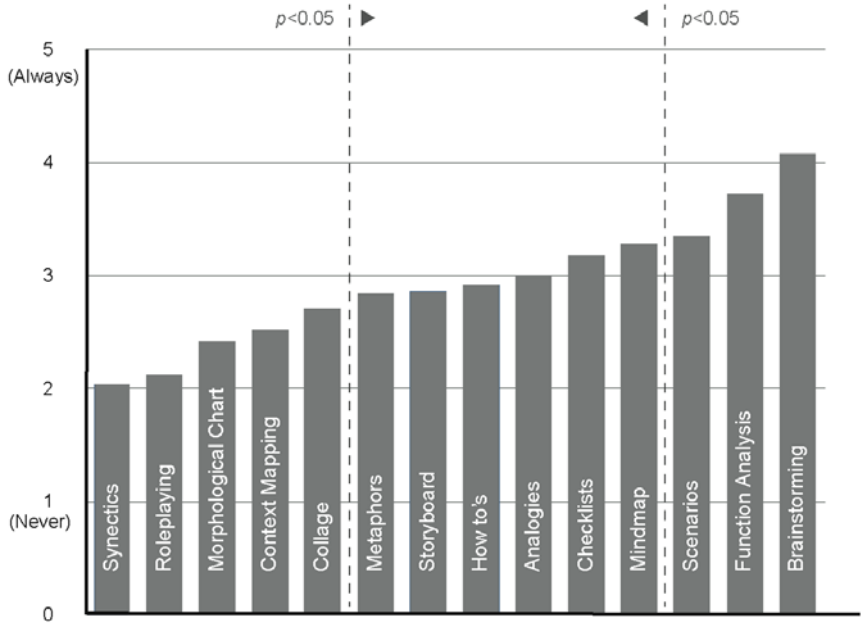

Figure 4. Experts: frequency of use of design methods

3.1.3. Reflection on the design process

The questions about reflection on the design process focused on the following aspects: 1. Attachment to initial ideas; 2. Stuckness; 3. Mental set; and 4. Design fixation.

Analysis on the frequency of responses shows that novices show a tendency to be more aware of repeating parts or principles of previously seen examples – i.e. design fixation (Figure 5), than they are of exhibiting the other three behaviours. However, the remaining three aspects do not show much variation between one another.

Experts and novices alike are more aware of being fixated in repeating (parts or principles of) precedents than exhibiting any of the other behaviours (Figure 5 and 6). Awareness on design fixation was significantly more acknowledged by the experts in comparison to being caught in just one possible solution (stuckness, $p < 0.01$); and awareness of exhibiting a tendency to use only one way to deal with a problem (mental set, $p < 0.01$). A marginal significance can be observed between design fixation awareness and propensity for keeping the first idea (attachment to initial ideas, $p = 0.078$).

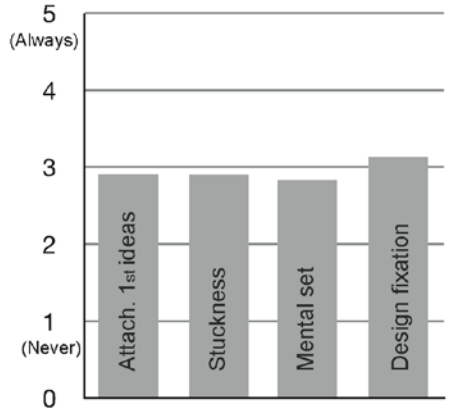

Figure 5. Novices: reflection on the design process

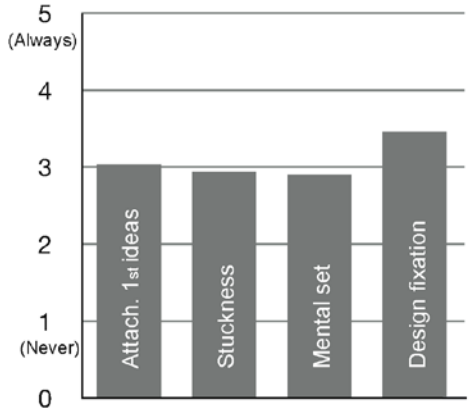

Figure 6. Experts: reflection on the design process

3.2. Between-group analysis: novices and experts

In the following sections we introduce the results from the analysis between-groups, in order to observe possible differences between novices and experts.

3.2.1. Preferences for representational stimuli

Differences were found regarding the importance both groups of designers attribute to the use of various representation stimuli during idea generation – i.e. images, objects and text. Novice and expert designers assigned equivalent importance to the use of *images*, but not to the use of *objects* or *text*. Significantly high differences were found about the higher importance experts give to *objects*, as representation stimuli ($t = 2.046$; $p < 0.05$), when compared to novices. On the other hand, novices exhibited a numerically higher (yet not significant) tendency to rely more on *text* than experts do during idea generation ($t = -1.841$; $p = 0.068$).

3.2.2. Ideation methods

Highly significant differences were observed between novices and experts on only three ideation methods – Brainstorming, Context Mapping and Function Analysis. Novices claimed to apply Brainstorming and Context Mapping more often than experts ($t = -2.115$; $p < 0.05$, and $t = 2.216$; $p < 0.05$, respectively, Figure 3). Conversely, expert designers showed a tendency to use Function Analysis more frequently than the novices ($t = -3.133$; $p = 0.068$, Figure 4).

3.2.3. Reflection on the design process

In the last section, we present the responses of the participants' awareness concerning potential counterproductive behaviours during ideation phases. For further clarification, we asked the participants to fill in additional open questions, explaining what they would do in such circumstances. Interestingly, both groups show no significant differences between their level of awareness concerning *attachment to initial ideas*, *stuckness* and *mental set* situations, suggesting experts and novices keep a similar level of awareness on these aspects (Figures 5 and 6). However, when asked about how frequently they were aware of repeating previously seen parts of examples (design fixation), experts seemed to be better prepared than novices to recognise the occurrence of such behaviour in their design process ($t = 2.301$; $p < 0.05$). Through the open questions it was possible to ascertain that experts consider such type of *repetition* an advantageous and appropriate practice in order to achieve more effective solutions. Some of the answers given by the experts reflect an intentional commercial strategy, driven by a market that demands easy to implement, cheap and recognisable solutions. As stated by an expert participant: "*Often the objective is to make something that you know works well and not trying to be innovative, as that can add costs and time to a project*". Additional responses

indicated also that this behaviour was due to a learning process, where experts rely on previously proven solutions in order to tackle unfamiliar problems, as phrased by another respondent: *"If it is a good example, learn what's good about it and use it as inspiration. Don't reinvent the wheel"*.
Ultimately, repeating parts or principles of previously seen examples is considered by the experts as an effective way to design, like stated by another participant: *"I think it saves me a lot of work"*. Therefore, the results indicate that the tendency to repeat parts or principles of successful existing solutions is not only considered common practice, it is perceived as a well established strategy in design practice.

4 DISCUSSION

According to the results obtained from the questionnaire, the novice and expert designers taking part in this study show clear differences on the inspirational choices they use during idea generation. It is important to take into account, though, that the results obtained are self-reported, and thus some answers could be biased by inaccuracies related to participants' perception on the topics covered.

4.1. Use of images

Both novice and expert designers give identical importance to the use of two-dimensional representations (images in general, as well as photographs and drawings). This fact coincides with the general assumption that there is a preference for utilising visual representations during the search for inspiration. However, research has demonstrated empirically that exposure to this type of visual stimuli can have both a positive [e.g. 34, 1] as well as a negative effects [e.g. 8, 17] on idea generation. Hence, one can speculate whether there is too much importance given to images both in design education and practice, instead of a more balanced selection of diverse representation stimuli (for instance, text and physical objects). *Texts*, for instance, seem to be as easily accessible and widespread as *images*, yet they are far less utilised, when they actually have the potential to positively inspire designers [4].

4.2. Use of objects

It was shown here that expert designers make more use of three-dimensional representations (objects such as mock-ups, prototypes and commercial products) than novices. On the one hand, this could be explained by a better developed ability of experts to visualise three-dimensionally. Such ability could be simply the result of their accumulated experience and opportunity to expand on alternative inspirational resources. On the other hand, experts' preference for using three-dimensional representations, for instance existing commercial products, could also be related to having easy access to rapid prototyping techniques. In comparison to novice designers, who depend mainly from – often limited – educational institutions infrastructures to build their first models, experts working in industry are in a better position to build mock-ups and prototyping in an earlier stage. Lastly, differences between novices and experts inclination to use three-dimensional stimuli could be related to the impact that this type of info/material might have on their final work. Whilst the outcome from novices is often a conceptual representation of a possible solution, an expert working in industry is supposed to be involved in the production of a *real* product (with serious financial repercussions in case of 'market failure'). Therefore, the expert has to know a lot more in detail the designs being generated, which is achieved by having access to available physical examples and prototypes.

4.3. Use of text

Interestingly, our results indicate that novices use *text* more often that experts when looking for inspiration. Verbal representations have been seen as suitable stimulus for the employment of analogies and hence for the enhancement of creativity [35]. It unclear why novices favour this type of stimuli more than experts do. It could be that they are exposed to particular education programmes where there are more opportunities to undertake diverse design exercises. Conversely, it is interesting that experts make such little use of verbal representations. This could be explained by the lack of time experts face in design practice. Typical time constraints observed in industry settings, might render experts unable to spend time browsing for inspiration in different types of *text*. Retrieving inspiration from *images*, on the other hand, would be a faster option.

4.4. Ideation methods

Regarding the preferences for ideation methods, it was interesting to observe that, even though Brainstorming has been empirically investigated as less creative in terms of fluency and flexibility [36], it is the most widely used method according to our respondents. This tendency only comes to confirm the general preference designers (both in industry and education) have for this method. However, and based on our respondents' feedback, it seems that Brainstorming is often not implemented as it is expected (according to the instructions explained by Osborn [37]). Hence, such *ad hoc* procedures may result in novices and experts both naming Brainstorming to the mere activity of discussing ideas (which would probably involve criticism/judgment).

Roleplaying, Synectics and Morphological Chart were the least preferred methods used by both experts and novices. Interestingly, these three methods do not share the same apparent characteristics. Roleplaying focus on the interaction between user and product, in which the designer re-enacts the situation of use. Synectics is a comprehensive creative procedure that is supposed to help (in this context) designers not only to analyse the problem, but also to generate and select ideas based on the use of analogies. Moreover, it is quite a complex method, difficult to carry out, which can explain why novices favour easier and result-oriented methods as alternative. Finally, Morphological Chart is not an idea generation method *per se*. Instead, it is aimed at helping designers to identify functions and sub-functions of a problem. All these methods are based on very distinct concepts, namely: enacting with body language, verbal representations, and visual representations, respectively. Nevertheless, they tend to be used only to understand the problem in-depth, which explains why these methods might be least favourite ones during idea generation.

Our results also indicate that experts make use of a larger range of methods, which they apply during idea generation, whilst novices generally tend to use only Brainstorming. In fact, novices apply Brainstorming significantly more than experts. Experts, on the other hand, rely not only on Brainstorming but also on Scenarios and Function Analysis. In fact, the experts' top three method selection corresponds to three very different, yet complementary, approaches to design problems. Brainstorming enables the generation of large number of ideas, hence expanding the solution space. Scenarios facilitate an overall understanding of the *users* and the *context of use*. Finally, Function Analysis represents a very systematic analysis of the relation between the functions of a system and the different parts of the future product. Together, these methods form an inclusive understanding of the several nuances of the design process, which might present the potential to generate better solutions. This suggests that novice designers' tendency to favour Brainstorming as generative method may prevent them from benefiting from using other useful methods.

4.5. Reflection on the design process

Regarding the awareness of potential pitfalls designers may fall into during idea generation, the results show that experts appear to engage in a deeper reflection compared to novices. We assume that experts were more explicit at recognising their tendency to, for instance, being fixated on available precedents during their design process (including physical attributes and principles). However, the respondents generally considered this as a natural and well-accepted procedure during idea generation. The participants reported of a number of reasons that can be linked to the following two main concepts:

1. Commercial strategy - one of the main goals in industry is to make products that satisfy a commercial and functional need, which does not necessarily depend on developing a completely novel idea.
2. Cognitive economy – in order to cope with time and budget constraints, expert designers seem to employ cognitive 'short-cuts', by reusing previously seen examples instead of creating everything from scratch.

The experts' responses on reusing precedents are, to some extent, contrary to empirical studies that found that repetition could at times lead to poorly design concept solutions. However, this same research generally considered *repetition* as a hindrance to generating creative solution ideas, when transference between precedent and new solution idea was not thoroughly assessed. Therefore, as experts reported on *repetition* as a convenient approach in design practice (to simplify and accelerate the design problem solving process), we can assume that they are thorough about how they make use of available precedents.

5 CONCLUSIONS

This research study should provide a better understanding of what separates novice from expert designers, regarding their range of choices on sources of inspiration and ideation methods. The findings presented here could have implications for design education as they reveal that novice designers tend to stick to a limited array of external stimuli and ideation methods, which could ultimately result in a hindrance to design creativity. Instead of expanding the potential pool of representational stimuli utilised, novice designers tend to ignore other forms of stimuli, such as textual. Whilst to some extent there is an 'obvious' link between the use of *visual representations* as inspiration for the generation of the typical design solution outcome (a *visual* three-dimensional embodiment *per se*); there is no immediate justification as to why other inspiration typologies (for instance non-visual ones) could not be equally explored while generating creative design ideas.

Regarding designers' preferences on ideation methods, the participants of this study seem to favour Brainstorming over other techniques. Such reported preference is interesting and can be explained, for instance, by the feeling of progress and creative liberation Brainstorming can portray, due its characteristics of rapid flowing of ideas and non-criticism. However, novice designers learn how and when to apply more appropriate ideation methods apart from Brainstorming. This fact leads us to believe that it would be interesting to carry on more research on why the latter is so preeminent in designers' preferences when choosing an idea generation method.

On the topic of reflection, the findings indicate that expert designers consciously apply what could be considered as a potential counterproductive behaviour, i.e., the repetition of parts or principles of previously seen examples (design fixation). This fact is consistent with an apparent practice of cognitive economy, especially to cope with limitations in regard to reasoning resources. Whereas this would normally be considered a risky procedure when a high original product is the desired goal, it could also be seen as a suitable behaviour if a rich level of awareness is present. Nevertheless, novice designers do not seem to engage in a conscious reflective process, which can lead to a misuse of sources of inspiration and their application in new designs.

According to these results, and applying these insights into the design education realm, there are three major factors to consider: Firstly, it is necessary to broaden how novice designers deal with external stimuli and how they apply ideation methods. Secondly, expert designers should be aware that even if the practice of a cognitive economy strategy can be advantageous in specific situations with financial and resources limitations, it can also become limitative to creativity. Lastly, these two factors can be improved by enhancing the importance of reflecting during the design process, that may be helpful to identify and avoid such counterproductive behaviours like the ones analysed in this study: *attachment to initial ideas*, *stuckness*, *mental set*, but specially, *design fixation*.

Even though it is important to acknowledge that the feedback collected from the questionnaires is partially based on the participants' self-assessment, we are now in better position to know *when* and *what* do designers (reportedly) look for when they are searching for inspiration. Nonetheless, there are still a number of important questions to be investigated for instance: How do different sources of inspiration support creative idea generation? What are the most appropriate sources/stimuli? How should they be presented to designers? It is expected that the results from the present study will steer future research on some of these topics.

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