

論文 / 著書情報  
Article / Book Information

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| 題目(和文)            |                                                                                                                                                                                                |
| Title(English)    | Investigating the Impact of Magic-based External Stimuli on Creativity and User Experiences in Product Design                                                                                  |
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| 学位種別(和文)          | 博士論文                                                                                                                                                                                           |
| Category(English) | Doctoral Thesis                                                                                                                                                                                |
| 種別(和文)            | 要約                                                                                                                                                                                             |
| Type(English)     | Outline                                                                                                                                                                                        |

# 論文要約

THESIS OUTLINE

## 要約 (英文 800 語程度)

Thesis Outline (approx. 800 English Words )

Chapter 1 described the importance of creativity on product design, discussed about analogical thinking, which is a fundamental creative process, together with a theory from cognitive science that primary cognitive thinking (e.g. thoughts that are not limited to rules, reality) as origin of creativity. This thesis then proposed magic effects as the external stimuli for creativity, and stated the goal as to create a tool for creativity which divided into three sub-goals about content, representations, and usage guideline.

Chapter 2 is literature review of existing ways to enhance creativity. First the thesis described the definition and criteria of creativity, then it reviewed the effects of external stimuli on design creativity as conducted in other previous researches (e.g. proximity, fidelity, modality). The second part is the review of 112 existing tools for creativity from both the market and in research field. The tools are categorized into two main categories and eight sub-categories to show the overview of design tools for creativity.

Chapter 3 established a set of magic-based elements to use as inspirations and assess the effects on creativity. Different categories of magic effects as described by professional magicians were categorized into a set of 15 magic effects. The set was experimentally evaluated in a design session with 30 participants. The findings showed that when exposed to the magic effects set, their product ideas were significantly better in terms of flexibility and originality with decreased feasibility.

Chapter 4 reported the creation of the magic effects set into two deck of cards, a 'Magic cards' containing cards that show illustrations of magic effects, and a 'Magic Video cards' containing the same cards plus videos of magic tricks. The tools were experimentally tested with 30 novice designers. The findings show that the use of magic-based inspiration in both formats resulted in significantly more original but less feasible ideas, and that the use of videos led to design ideas that were significantly more 'enjoyable' and more 'exciting' than the use of cards only. (Haritaipan, Saijo, & Mougenot, 2018a)

Chapter 5 purposed the magic effects in another form that is relatively closer to the design task, 'magical products' i.e. products that have functions comparable to magic effects. 15 existing products were selected, one for each magic effect, and were created as a deck of cards showing pictures of those magical products. This 'Product cards' was evaluated compared to 'Magic cards' with 20 participants in a design session. The findings show that the use of Product cards helped designing significantly better UX but with drawback on feasibility. To overcome this, we created two 'dynamic' versions of the Product cards: Lenticular cards and Video cards. The cards were experimentally tested with 40 participants in a similar design session. The findings showed no significant differences between all three modalities of the cards on the design outcomes.

Chapter 6 purposed the magic effects in another form that is in proximity between 'Magic cards', and 'Product cards', Technical cards, which contains technical clues of how each magic effect could be technically plausible. Technical cards were compared with revised Magic cards by 30 novice designers in two design sessions over two weeks. The findings show that the use of both types of magic-based cards resulted in significantly higher scores in originality and flexibility of ideation. Also, the use of Technical cards led to significantly higher intended UX scores. Our study suggested that sketches together with technological clues is the most effective representation of magic effects on creativity and UX. (Haritaipan, Saijo, & Mougenot, 2018b)

Chapter 7 reported the development of a usage guideline to use the magic-based inspiration cards effectively for novice designers. Six professional designers with three levels of design experiences were invited: junior (two years), intermediate (seven years), and senior (more than 12 years). The verbal protocol analysis revealed that when provided with the cards, the designers produced more ideas and concerned more about expected behavior of products. On the other hand, design experience negatively impacts fluidity of ideas. Our findings suggested that design process is correlated with fluidity and elaboration, but not originality and feasibility. Finally, a usage guideline on how to use the magic-based tool effectively is developed based on the approaches carried by professional designers. (Haritaipan, Mougenot, & Saijo, 2019)

Chapter 8 concluded this thesis by discussed achieved research goals set in introduction chapter, then benefits and drawback of the tools, and dilemma between originality and feasibility were discussed. Finally, two potential direction for future research were described. First, the use of cards in group ideation has high potential to solve feasibility problem. Second, the use of psychological methods could be used to develop for another version of the cards aiming for the creation of products which provide magical user experiences.

### Reference publications

- Haritaipan, L., Saijo, M., & Mougenot, C. (2018a). Leveraging Creativity of Design Students with a Magic-based Inspiration Tool. *Proceedings of the 20th International Conference on Engineering and Product Design Education (E&PDE 2018)* (pp. 265-270). Dyson School of Engineering, Imperial College, London, UK. Retrieved from <https://www.designsociety.org/publication/40775/LEVERAGING+CREATIVITY+OF+DESIGN+STUDENTS+WITH+A+MAGIC-BASED+INSPIRATION+TOOL>
- Haritaipan, L., Saijo, M., & Mougenot, C. (2018b). Impact of technical information in magic-based inspiration tools on novice designers. *International Journal of Technology and Design Education*. <https://doi.org/10.1007/s10798-018-9476-x>
- Haritaipan, L., Mougenot, C., & Saijo, M. (2019). How professional designers use magic-based inspirations: development of a usage guideline and analysis of impact on design process. *International Journal on Interactive Design and Manufacturing (IJIDeM)*. <https://doi.org/10.1007/s12008-019-00530-5>