

3D CAD AS AN INNOVATIVE IDEA GENERATION TECHNIQUE: COGNITIVE EVIDENCES AT CONCEPTUAL DESIGN STAGE

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Abstract

The capabilities of 3D CAD software as a medium for innovative idea generation like pencil and paper sketching often debated lately. Design concepts using 3D CAD is a controversial issue among designers because its facilities are not suitable for conceptual design stage. The reason is that 3D CAD created just to use at the later stage of the design process after the idea of a design has been crystallized in conceptual design process. Thus, the focus of this study was to explore and investigate the ability of 3D CAD software to generate innovative ideas when used in conceptual design process. The study was conducted on three novice designers from mechanical engineering courses at community colleges in Malaysia. They were given a design problems and asked to design using 3D CAD software as an idea generation techniques in early stage of design process (conceptual design). The 'think aloud protocol' was used as a method of data collection processes. This study is to determine the relationship between cognitive processes of designers and 3D CAD processes during solving the problems of product design. The results of the observations found that there is an idea-generation elements emerged including novelty (17.7%), quantity (9.5%), quality (38.8%), and variety (34%) were captured during design processes. Based on the findings, 3D CAD software was found capable to generate innovative ideas in the early stage of the design process. This means, the use of 3D Cad software has a potential to influence designer's innovative ideas generation while designing product innovation.

Keywords: Idea generation, design study, product innovation, think aloud protocol.