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Design factors and functionality matching in sustainability products: A study of eco-showerheads

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Design Factors and Functionality Matching in Sustainability Products: A study of eco-showerheads

Abstract

The Demystifying the Shower Experience research project is a comprehensive multi-stage study aimed at understanding the multi-dimensional aspects of the shower, including; showering products, habits, behaviour and perceptions. The objective was to determine: if a functionality mismatch occurs between the design and desired functionality of the product, and what specific factors contribute to this mismatch. To achieve the aim, simple heuristic trials packaged as a *12 showerheads in 12 weeks Challenge* were conducted involving 12 participants – 6 male and 6 female. It was found that showerhead design factors such as colour, shape and size are inconclusive in determining the water efficient use, and perception of a positive shower experience. However, factors such as the number of function inform user choice and preference of which showerhead to choose and use. Further, sprout type and mode of operation both influence user perception of the performance factors such as feel, pleasantness, enjoyability, time taken and effectiveness of clean. And these factors in turn significantly affect the user perception of what constitutes a 'good' shower experience.

It was found that a functionality mismatch does occur in sustainability products if performance, and not design factors, fail to meet with user expectations. This work is novel because few, if any, studies of this nature have specifically been undertaken outside of the laboratory environment, and significant because the findings highlight the importance and influence of the physical design and performance-informing features on the user perception of the product itself. And for showerheads, this affects the satisfaction with the resulting showering experience and, therefore the propensity to use less water in the shower for an effective clean.

Keywords: Product design, Product performance, Product preferences, Sustainability, User study, Water efficiency

1. Introduction

The efficient use of natural resources is top global political, social and economic agenda. The need to be resilient and assure the supply of essential natural resources such as water, has resulted in a myriad of strategies and solutions, including technological interventions, behaviour change campaigns, pricing regulations and other mechanisms, and in certain extreme cases, resource controls and rations which for water means drought orders and restrictions. In Australia for example, drought, coupled with growing populations enabled state and local government to implement alternative water supply schemes, along with a range of demand management interventions, in order to improve urban water security (Willis *et al.* 2013).

The need for innovative and intuitive consumer products to stimulate user behavioural responses in order to achieve the necessary improvements in water use is long established. After all, design, technological and engineering methods have the potential to mitigate wasteful practises during daily processes; e.g. washing of hands, and to assist in persuading or guiding users to operate products in a more sustainable manner, through self-management of resource consumption (Lockton *et al.* 2008). Studies conducted in the UK and US report that on average, applying water efficient designs and products leads to 15% less water use, 10-11% less energy use and 11-12% reduction in operating

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