



Dreams Really Do Come True: How 3D Technology Will Shake the Future of Online Retailing

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Introduction: The retail industry today is rapidly changing and seeks innovative approaches for success in the business world. Through hardships and growth, one can see the industry change and develop in many ways. Along with this ever increasing change, COVID-19 has created an even bigger push for 3D technology to be implemented in the industry. Especially, the characteristics of Gen Z, the emerging consumer market, needs to be studied as they have a significant buying power. However, there is a lack of studies on Gen Z consumers' attitudes towards adopting 3D technology in apparel purchases. Adapted from the theory of planned behavior (Ajzen, 1985), we proposed a research model (Figure 1) to investigate the significant drivers that evoke the excitement of 3D technology, which in turn increases Gen Z consumers' 3D technology adoption intentions.

Literature Review: *Online Shopping Frequency:* Looking into online shopping frequency, we wanted to determine whether a consumer's frequency of online purchases for a brand would increase a consumer's willingness to adopt 3D technology. This led to a search for what consumers were willing to divulge to a specific brand, in terms of personal information. From this information, we developed **H1:** Consumers with a higher level of online shopping frequency for a brand will increase the perceived excitement for the 3D technology implementation. This hypothesis investigates a consumer's intention to shop a brand online, and their willingness to share body measurement related information on a retailer's website, in exchange for the use of 3D technology. *Trust in Fit:* We proposed that consumers who are already familiar with a brand will trust the fit of the brand's clothing, therefore making them more likely to adopt the 3D Technology implementations. "With rising customers' demand for more personalized clothing, it has become even more essential for technology suppliers and retailers to provide them what they want" (Stitch World, 2020). By utilizing 3D technology, online retailers can have more freedom to produce mass customized clothing. This led to **H2:** A higher level of perceived product fit will increase the excitement for the 3D technology implementation. *Perceived Consumer Effectiveness:* Perceived consumer effectiveness has been consistently documented to influence sustainable consumption decisions and consumer behavior (Neumann et al., 2020). With knowledge of the sustainable attributes that this 3D technology provides, a higher level of perceived consumer effectiveness will increase excitement of using 3D technology, then leading to adoption intention. Therefore, **H3:** A higher level of perceived consumer effectiveness will increase the excitement for the 3D technology implementation. *Environmental Concern:* An individual's general orientation towards the environment (Neumann et al., 2020). As 3D technology implements sustainable attributes in the design element of the supply chain, it can actually cut down the waste of the retail industry. With knowledge of the design element of 3D technology on the environment, consumers will feel that their individual beliefs of the retail industry

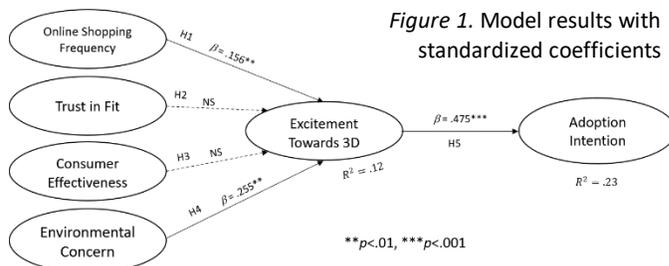
contribute to solve environmental issues. Thus, bringing us to **H4**: Consumer with high level of environmental concern will increase the excitement for 3D technology implementation.

Excitement towards 3D Technology: The primary or secondary benefit for consumers who actively seek products is emotion arousal (Mothersbaugh et al., 2020). Using 3D technology within a retailer’s omni-channel can help a consumer feel more pleasurable and aroused. Consumers expect to find both entertaining elements and supporting tools enhancing the quality of their shopping experience (Pantano, 2014). Thus, **H5**: The excitement for 3D technology implementation will increase the 3D technology adoption intentions.

Methodology: An online questionnaire was developed to measure the perceptions of 3D technology and willingness to adopt the 3D technology. The questions were based on previous research (Neumann et al., 2020; Wodehouse & Abba, 2016). The survey was sent out to enrolled college students in a Southwestern university. A total of 340 responses were collected, with 286 usable responses after data cleaning. This questionnaire included 29 questions in four categories of shopping frequency, trust of fit, sustainability (i.e., perceived consumer effectiveness and environmental concern), and demographics.

Analysis and Results: Among the 286 usable responses, 87% were female and 49% of the participants said they shop online more than 8 times a year.

To test the proposed hypotheses, we conducted multiple regression analyses. Results of the multiple linear regression indicated that there was a collective significant effect of online shopping frequency and environmental concerns on 3D technology adoption attentions ($F(4, 265) = 8.96, p < .001, R^2 = .12$). The individual predictors were examined further and indicated that shopping frequency ($\beta=.16, t = 2.67, p < .01$) and environment concerns ($\beta=.26, t = 3.51, p < .01$) significantly increase the excitement of 3D tech implementation in the model. Therefore, H1 and H4 were supported. However, there was no significant effect of the satisfaction of product fit



and perceived consumer effectiveness on the consumer excitement. Thus, H2 and H3 were not supported. Last but not least, the excitement of 3D technology implementation was found to significantly increase the 3D technology adoption intentions ($\beta=.48, t = 8.91, p < .001$). Thus, H5 was supported.

Findings and Implications: The findings suggested that consumers are not naturally inclined or excited to adopt 3D technology when it pertains to the consumer’s trust in fit of garments from online shopping and consumer effectiveness. In contrast to consumers not trusting the fit of garments online, consumers are excited about the implementation of 3D technology when it pertains to their online shopping frequency: giving their shopping experience to be more hedonic. The findings suggest that Gen Z consumers are also more willing to adopt 3D technology when given the information of the sustainability attributes the technology offers, thus allowing environmental concern to be a factor that excites them and leading them to adoption intentions. The results helped to determine that fashion brands initially need to implement the 3D technology through their online platforms. For future research, targeting a larger demographic to take the survey may be more beneficial.

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