

Product Involvement and Self-efficacy on Perceived Value of Co-design

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KEYWORDS Co-creation. Customer Value. Customization. Service-dominant Logic. Mediation

ABSTRACT The challenge that firms face today while deciding to engage customers to co-design is in identifying the customers who value co-designed product. The objective of this paper is to find whether the perceived value of buying a co-designed product will be more for a customer with high product involvement and whether this relationship is mediated by co-design self-efficacy. The study used a cross-sectional research design and collected data from 1052 respondents using a survey. The results indicate partial mediation of the relationship between product involvement and perceived value of co-design through co-design self-efficacy. Based on the findings, it is recommended that firms can target consumers with high product involvement when looking to invite customers to take part in the co-design process. Further, firms should share relevant information and devise the co-design process in a way that would increase co-design self-efficacy.

INTRODUCTION

Businesses today are striving to increase customer value. Value creation has been a part of the mission statement of many successful firms (Kumar and Reinartz 2016) and considered as an important research priority by Marketing Science Institute (2018). Different firms follow different strategies to provide value to customers including customer relationship management, supply chain management, innovation, etc. Recently, manufacturing industry is transforming towards service-dominant view of markets (Feng et al. 2018). According to service-dominant logic (SDL), the value is not created and delivered by the producer; instead, it is realized when the customer uses the products (Vargo and Lusch 2008). Hence, firms need to understand that apart from adding value to the products they manufacture, they should enable their customers in realizing the value of the product.

A firm's offer of providing an opportunity to co-create products is a technology-based service offer that allows customers to participate in

the co-creation process and increase the value of a product (Dellaert and Dabholkar 2009; Turner 2018). Co-creation is a holistic concept that encompasses different forms of contribution by customers in the value creation process right from sharing information, co-designing products, co-producing by participating in production to creatively consuming products (Damkuvienė et al. 2012). When firms engage in customer co-design, customers enter the value chain much earlier and use the resources provided by the firm to create value. In this process, firms vest the consumers with the responsibility of finalizing the design and features of a product, thus providing a wider scope for value addition. When co-design option is offered through mass customization, the design and features finalized by the consumers are manufactured at almost mass production efficiency and delivered to consumers within a short time.

When customers participate in the co-design process, apart from increasing the resultant product value, they also realize value due to participation in the co-creation process (Merle et al. 2010). The premise of SDL and co-creation is that each customer's need is unique and a standard product designed by the company may not fully satisfy the customer's need. Hence, when customers provide input based on their individual requirements and decide on the product's final design and features, it is likely to enhance the value of the product to a great extent. But

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customers may not have such individualized requirements for all the products they consume. Also, while there is a significant portion of the market (not niche) that wants to customize products, there is also significant counterparts who may not want to customize a product (Piller and Müller 2004; Calegari and Fettermann 2018). Product involvement may be an important deciding factor when it comes to deciding whether a customer has such individualized requirement.

Traditionally, the onus of innovation that can lead to providing solutions for customers' problems rested with the producers. With the responsibility of value creation shifting from just the producers to include customers, the amount of value created is likely to vary based on the customer. Apart from the variation in the perceived value, some customers may prefer a standard product over custom product for the fear of wanting or choosing an option only to later regret their choice (Syam et al. 2008; Jiang et al. 2016). Thus, when a customer has higher self-efficacy towards participating in the co-design process, their perceived value of co-design may also increase.

In the extant literature on co-design, the product involvement and knowledge have been identified as motivators that drive consumers towards co-design (Hoyer et al. 2010; Damkuvienė 2012). In fashion products, product involvement was found to moderate the perceived benefits of mass customization (Park and Yoo 2018). Prior researches have used the construct of product involvement as both moderator and mediator, thus requiring further attention (Sheeraz et al. 2018). The unique contribution of this paper is that it has conceptualized the influence of product involvement on the perceived value of mass customization to be mediated by self-efficacy.

Theoretical Framework

Product Involvement

Involvement has been an important construct that helps to understand the behavior of consumers. Involvement is a motivational construct that manifests the extent of importance a person places on an object, decision or situation based on his/her basic needs, innate values and concerns (Zaichkowsky 1985). Product involvement is a consumer's level of interest in a product based on his/her perception of how the product is instrumental in meeting important values and personal goals.

Involvement is an arousal (Andrews and Shimp 1990) that would induce a person to engage in different activities related to the object of interest. When it comes to product involvement, these activities may include spending a lot of time thinking about it, interacting with the product and seeking to acquire the product (O'Cass 2000).

Perceived Value

Consumer perceived value is an important construct in consumer behavior research (Holbrook 1987). A consumer assesses the perceived value of a product or service based on the perceived benefit that the consumer receives and the costs, time and effort that the consumer incurs when buying the product (Yang and Peterson 2004).

Value is relative and is based on individual customers' requirements and preferences. Perceived value is a multidimensional construct with value dimensions varying based on individual consumer's personal requirements and situation (Sheth et al. 1991). Customer's overall assessment of the perceived value of an offering is based on by how much perceived benefits outweigh the undesired consequences or cost that the customer has to bear and is in comparison to competitive offerings, expectations, or past experience (Kumar and Reinartz 2016).

Co-design Self-efficacy

The influence of self-efficacy on behavior has been empirically validated in many different fields (Kim and Kim 2005). Prior research has shown self-efficacy to influence acceptance of technology through perceived ease of use (Venkatesh and Davis 1996). In the context of co-creation where a customer has to voluntarily take part in the co-creation activities, self-efficacy is believed to influence the behavior and performance of the customer.

Self-efficacy is an individual's perception of his or her ability to carry out required courses of action to achieve the desired level of performance in potential scenarios (Bandura 1982). Self-efficacy is more to do with self-belief about what one is capable of than about the actual skill one possesses (Bandura 1986).

Depending on the complexity of the co-design process, customers may require knowledge

and skills to participate in the co-design process. As the number of product attributes that can be modified by the customer increases, the sheer number of choices can make the co-design process overwhelming. For example, the possible combination offered by BMW 7 series was as high as 10^{17} (Hu 2013).

The level of performance of customers in the co-design process affects the resultant product that the customers receive.

Hypotheses Development

Prebensen et al. (2010) and Kim et al. (2015) have considered consumer involvement as an antecedent to perceived value and found empirical support for the relationship in tourism industry. Since a consumer with high product involvement finds more information about the product and spends time thinking about it (O’Cass 2000), such a consumer is likely to have specific individualized requirement towards the product. Hence, it is hypothesized that product involvement has a positive influence on the perceived value of co-design.

H1: The Product Involvement has a Positive Influence on the Perceived Value of Co-design

A cognitive structure that a consumer develops due to his/her high interactions with the product and indulging in thoughts about it, enhances his/her learning about its functionality and requirements (O’Cass 2000). For utilitarian products, a positive relationship between involvement and product attribute knowledge has been established (Park and Moon 2003). This product knowledge would increase consumers’ confidence in using and selecting the product. In the context of internet usage, the involvement positively influences the self-efficacy (Akhter 2014). Hence, it is hypothesized that product involvement will positively influence self-efficacy of participating in the co-design process.

H2: Product Involvement Positively Influences the Co-design Self-efficacy

Self-efficacy is found to have an influence on consumer’s perceived value when the resultant outcome is dependent on the consumer’s contribution (McKee et al. 2006). Support for

the positive influence of self-efficacy on perceived value has been found in technology-based self-service context (Van Beuningen et al. 2009). Hence, it is hypothesized that, in the co-design context, where a customer plays a role in selecting the style, functionality, and features to be included in the product, co-design self-efficacy will enhance the perceived value of co-design.

H3: Co-design Self-efficacy Positively Influences the Perceived Value of Co-design

Based on the relationship of product involvement with self-efficacy and perceived value and the relationship between self-efficacy and perceived value identified through literature review, it is hypothesized that the positive relationship between product involvement and perceived value is mediated by co-design self-efficacy.

H4: The Positive Relationship between Product Involvement and Perceived Value of Co-Design is Mediated by Co-design Self-efficacy

In summary, the conceptual model proposed in this paper as shown in Figure 1, tested the relationship between product involvement, co-design self-efficacy, and perceived value.

Objectives

The main objective of this paper is to find the effect of product involvement on the consumer’s perceived value of buying a co-designed product. How well the resulting product matches with what the customer wanted depends on customer’s ability to co-design the product. Hence, the role of self-efficacy in customer’s decision to opt for participating in co-design process and its mediating role in the relationship between product involvement and perceived value has been explored.

MATERIAL AND METHODS

Data Collection

The target population of this paper constituted of consumers who are willing to co-design a product. A survey was conducted among 1052 respondents. Since the study employed conve-

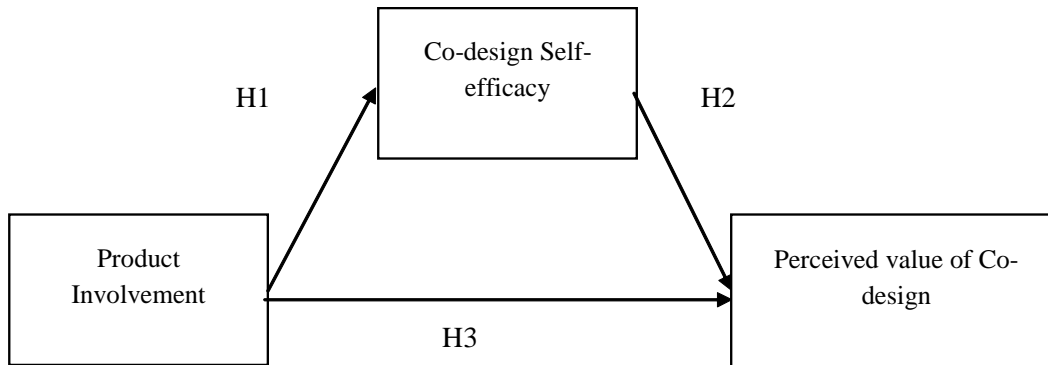


Fig. 1. Conceptual framework

nience sampling, respondents were predominantly students at undergraduate and postgraduate level programmes. The respondents of the study included university teachers, research scholars, government employees, lawyers, etc. The survey was conducted using a structured questionnaire. The respondents were given a hypothetical situation where they can co-design any one product of their choice and that each and every design change that they want would be incorporated and delivered to them. In this context, keeping the product of their choice in mind they were requested to respond to the questionnaire.

Procedure

The researchers have employed a cross-sectional research design. The primary data were collected using a structured questionnaire administered personally and was used for data analysis after screening for missing values and outliers. The data analysis has been carried out using statistical software packages SPSS and AMOS. The confirmatory factor analysis was carried out to assess the measurement model. The hypothesized structural model was estimated with the maximum likelihood estimation. The mediation analysis was performed using bootstrapping with 5000 bootstrap samples and bias-corrected confidence interval of 0.95.

Measures

The instrument was developed to measure the product involvement, self-efficacy towards participating in co-design process and perceived

value of buying a co-designed product based on scales from the extant literature that were adapted to make it suitable for the researchers' study.

To measure product involvement construct, five items from the 16-item product involvement scale (O'Cass 2000) have been adopted in this paper. To measure co-design self-efficacy, a scale developed for measuring customer self-efficacy in technology-based self-service (Van Beuningen 2009) had been adopted and modified to suit the co-design context. For measuring the perceived value of co-design, a scale developed by Merle et al. (2010) has been adopted and modified to suit the pre-purchase context of the co-designed product. The perceived value has been applied as a second-order construct with five dimensions of functional, uniqueness, self-expressive, hedonic and creative achievement values. For measuring the three constructs in the researchers' conceptual framework, they totally used 20 items in the instrument. All the items were measured using a 7-point Likert-type scale where the scale range started at 1 representing strongly disagree to a response of 7 indicating strongly agree.

RESULTS

The data analysis has been carried out using SPSS and AMOS. The responses, after screening for missing values were tested for multivariate outliers using Mahalanobis distance in AMOS. The outliers were removed, resulting in 487 valid responses which were used for further analysis.

Measurement Model

The measurement model was assessed using AMOS to evaluate the reliability, convergent validity, and discriminant validity of the constructs. The Microsoft Excel template developed by Gaskin (2016) has also been used for finding out the reliability and validity measures from the AMOS output. Reliability was examined using composite reliability, by verifying that for each construct, it was greater than 0.8. As given in Table 1, reliability exceeded 0.8 for all the constructs. To assess the convergent validity of the constructs, it was examined that the average variance extracted (AVE) were greater than the recommended 0.5. As shown in Table 1, for the constructs perceived value and product involvement, AVE was greater than 0.5 indicating that the items explain more than half of the variance in their hypothesized constructs. But for the self-efficacy construct, AVE was slightly less than 0.5 at 0.481. Based on Fornell and Larcker's (1981) suggestion, even though AVE was less than 0.5, since composite reliability was higher than 0.6, the researchers considered the convergent validity of the constructs to be adequate.

When the Heterotrait-monotrait (HTMT) ratio of correlations are less than the threshold value of 0.85, then the discriminant validity of the constructs can be ascertained (Henseler et al. 2015) In this study, the HTMT ratios for all the constructs were less than the threshold value of 0.85 confirming discriminant validity of all the constructs (see Table 1). Thus, the measurement model demonstrated adequate reliability, convergent validity, and discriminant validity.

Structural Model

The paper used Structural Equation Modeling (SEM) to test causal paths in the structural model. The proposed model showed an acceptable fit to the data with Chi-square = 675.366

significant at $p < 0.001$; CFI = 0.923; TLI = 0.911; NFI = 0.894; RMSEA = 0.064. The results show that product involvement has a positive effect on self-efficacy ($b = 0.500$; $p < 0.001$) and positive effect on perceived value ($b = 0.497$; $p < 0.001$). The self-efficacy has a positive effect on perceived value ($b = 0.326$; $p < 0.001$). Hence, hypothesis H1, H2 and H3 were supported by the results.

Mediation Analysis

The mediation analysis has been carried out by assessing the total, direct and indirect effects of the causal path model. The mediation analysis results are shown in Table 2. As indicated in Table 2, the total and direct effects of product involvement on perceived value and the indirect effect through co-design self-efficacy were significant indicating partial mediation supporting the hypothesis H4.

DISCUSSION

The main objective of this paper has been to analyze whether the self-efficacy of customers towards participating in the co-design process has a role in the decision of the consumer to opt for co-designed products and to find how this self-efficacy belief is influenced by their product involvement. Therefore, the important role of co-design self-efficacy in predicting the value that customers perceive in buying a co-designed product, and its mediating role in the relationship between product involvement and perceived value of co-design has been empirically tested.

The results indicated that the product involvement has a moderate effect and positively influences co-design self-efficacy. In the extant literature the role of personal characteristics in co-creation has not been researched (Füller and Bilgram 2017). But the results are in line with the

Table 1: Reliability, AVE, and the HTMT ratios of the constructs

<i>Construct</i>	<i>Composite reliability</i>	<i>Average variance extracted</i>	<i>Perceived value</i>	<i>Product involvement</i>	<i>Self-efficacy</i>
Perceived Value	0.914	0.680	0		
Product Involvement	0.881	0.598	0.4834	0	
Self-efficacy	0.787	0.481	0.6444	0.5588	0

Note: The off-diagonal elements are the HTMT ratios between the constructs

Table 2: Total, direct and indirect effects

<i>Hypothesis</i>		<i>Bootstrap</i>				<i>Signifi- cance</i>
		<i>Effect</i>	<i>Standard error</i>	<i>Upper limit of confidence</i>	<i>Lower limit interval of confidence interval</i>	
	<i>Total Effect</i>					
	Product involvement - > Perceived value	0.660	.036	0.595	0.715	Yes
	<i>Direct Effect</i>					
<i>H1</i>	Product involvement - > Self-efficacy	0.500	0.044	0.424	0.570	Yes
<i>H2</i>	Self-efficacy - > Perceived value	0.326	0.054	0.246	0.424	Yes
<i>H3</i>	Product involvement - > Perceived value	0.497	0.049	0.408	0.570	Yes
	<i>Indirect Effect</i>					
<i>H4</i>	Product involvement - > Perceived value through self-efficacy	0.164	0.029	0.123	0.222	Yes

Note: Bias-corrected confidence interval of 0.95% was used with 5000 bootstrap samples

findings of a similar study by Akhter (2014) in internet usage context.

The effect of co-design self-efficacy on the perceived value of co-design is positive with a small effect size. Prior research has found self-efficacy to positively influence participation in co-creation activities (Xie et al. 2008; Alves and Mainardes 2017). But the role of self-efficacy in increasing the perceived value of co-design has not been studied much. Hence, the results give new insight into the role of self-efficacy in enhancing the perceived value of co-design.

From the results, it is found that the product involvement positively influences the perceived value of co-design, and this effect size is moderate. This result supports similar results found in artisanal luxury products (Bhaduri and Stanforth 2017) and tourism (Kim et al. 2015).

The results of the mediation analysis indicated partial mediation of the relationship between product involvement and perceived value through co-design self-efficacy. Both the effects of the product involvement on co-design self-efficacy and co-design self-efficacy on perceived value of co-design are positive indicating complementary mediation. This means that product involvement has a direct positive effect on perceived value apart from the indirect effect through self-efficacy. So, for a customer with high product involvement, the opportunity to co-design that product according to their indi-

vidual requirement would be greater than others. Compared to product involvement, the impact of self-efficacy on perceived value is slightly lower. But the mediation results indicate that the indirect influence of product involvement through co-design self-efficacy is significant. This means that for a customer with high involvement towards the product, the knowledge he/ she possesses due to actively searching for information about the product and the time they spend with the product and in thinking about it, enhances the self-efficacy belief of a customer in co-designing a product, which in turn increases the perceived value of buying a co-designed product.

The perceived value construct has been operationalized using five dimensions of which functional value, uniqueness value, and self-expressive value are related to the product that the customer expects to receive at the end of co-design process whereas hedonic value and creative-achievement value are related to co-design process. Hence, it is more understandable when product involvement influences product related value. But the results indicate that hedonic value, which is the value that the customer expects to receive when they enjoy the participation in the co-design process and creative achievement value, which is the value of exercising creative potential are higher than the other dimensions of perceived value. The reason for this could be

that a customer highly involved with the product perceived value in an opportunity to spend time thinking about it, and working on it as enjoyable, irrespective of the resultant product they receive.

CONCLUSION

In conclusion, the results provide both theoretical and practical implications to researchers and practitioners. The self-efficacy construct has not been considered in earlier empirical researches conducted in co-design context. The role of product involvement and self-efficacy towards co-design process has been established through the results. For the customers with high involvement towards a product, the perceived value of co-designing the product will be greater than others with low involvement. Apart from directly influencing the perceived value of co-design, product involvement indirectly influences perceived value through self-efficacy. The customer with high product involvement will have greater self-efficacy towards performing co-design activities successfully which in turn positively influences the perceived value of co-design.

RECOMMENDATIONS

This paper provides both theoretical and practical implications for researchers and practitioners. The self-efficacy construct has not been considered in earlier empirical researches conducted in co-design context. Future studies should consider these relationships in specific product context to confirm the findings of this paper. When customers actually buy a co-designed product, their performance in the co-design process and the quality of the resulting product might influence their self-efficacy. Hence, it is recommended to further explore the role of self-efficacy in the post-purchase scenario and its impact on other variables of interest such as purchase intention and loyalty.

From a practical standpoint, it is recommended that firms opting to pursue co-design strategy should offer it for products for which the involvement of consumers is high. Further, firms can also explore ways to increase product involvement to increase the value of their offering. Given the role of self-efficacy in enhancing the perceived value, firms should disseminate

information that could help customers in increasing their self-efficacy. Whether the firm uses an online tool or assists customer who visit their store in the co-design process, the process of co-design should be structured keeping in mind the self-efficacy of customers.

LIMITATION AND SCOPE FOR FURTHER RESEARCH

The convenience sampling used in this cross-sectional research with more respondents from students could have resulted in sampling bias. The partial mediation results found in this paper may be due to other mediators such as perceived risk, word-of-mouth etc. not considered in this paper that affect the relationship which could be explored for future research. The paper has limited the responses to only customers who are interested in customizing at least one product in order to understand what makes them interested. However, the literature suggests that there is also a significant segment that would rather not customize a product. Future research should explore what characteristics differentiate a customer from wanting to customize a product whereas longitudinal studies with pre-purchase and post-purchase scenarios can be explored.

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