

The Role of Effectuation as a Device to Stimulate Innovativeness

Syed Khalid Ahmed and Syed Ali Raza Hamid (PhD)

Hamdard Institute of Management Sciences, Hamdard University- Islamabad Campus
syed.khalid@hamdard.edu.pk

Abstract

This study investigates the mechanisms that link entrepreneurial passion (EP) to product and service innovativeness. The study is causal and cross-sectional research. It investigates the mediating role of effectuation as a mechanism for the relationship between EP and product and service innovativeness. A primary research survey was conducted using a structured questionnaire among 306 respondents of micro small and medium enterprises (MSMEs). The data was analyzed using Hays process analyses SPSS version 4. Findings suggested that effectuation plays a significant role as a mediator to entrepreneurs' passion for product and service innovativeness in the context of MSMEs in Pakistan. The study finds a strong link between effectuation as a mediator to product and service innovativeness and recommends using the model of effectuation proposed by Sarasvathy (2008) as a process to innovate in the organization. The model of effectuation needs to be understood in order to be applied by new entrepreneurs of MSME. The study suggests academia to develop an understanding of this concept and make it a part of the curriculum of entrepreneurship study for startups and innovations by new entrepreneurs. Effectuation is considered predominantly at theoretical and investigational stages; this study adds the literature by an empirical study of its dynamics in the real-life scenario of established MSME's. This research recommended the effectuation model to the entrepreneur in order to develop a network for product and service innovativeness instead of trying to do everything on their own.

Keywords: *Passion, Effectuation, Innovation, Innovativeness, Process Model*

1. Introduction

Entrepreneurial passion is reflected to be the most vital measure for firms' embarked on innovation, it must be understood by the entrepreneurs how their passion can drive the organisation for innovative strategies (Luu and Nguyen, 2021). Entrepreneurial performance is obsessed with their behaviour to innovate. Innovativeness and performance are correlated to traits of entrepreneurs Zeb & Ihsan (2020). Entrepreneurial passion (EP) is the intense feeling and a burning desire to pursue a goal. This desire will empower the entrepreneur to overcome any hurdles and challenges coming in their way to perform (Cardon et al., 2013). Countries with comparatively small altitudes of entrepreneurial activity are omitted from a complete array of affirmative effects, from incomes and job creation to innovation and productivity growth (GEM, 2021). Around five percent of adults are running startups with some novelty in products and services only; which is encouraging that at least some initiatives are being taken toward innovation a fundamental element of entrepreneurship (GEM, 2021). However, six countries stated no one in their sample of entrepreneurs with a new venture who are bringing any innovation to their product or services is new to the world: Brazil, India, Pakistan, Oman, Belarus, and Morocco. The frequency of entrepreneurs with the prospect of extraordinary influence on their economies differs quite considerably, while those entrepreneurs introducing new products or services to the world are rare everywhere (GEM, 2021). Entrepreneurs' passion yields greater business development because of their pledge toward the business objectives Drnovsek, et al., (2016).

Innovations are considered to be the primary and the objective element to attaining competitive advantage and superior performance. However, the understanding of how and when

entrepreneurs' passion promotes firm innovation remains limited (Cai et al., 2021). The (GEM, 2021) report and the suggestions of (Cai et al., 2021) provide the rationale and a gap for this study. This study investigates to identify the process which can provide guidelines for product and service innovativeness for superior performance to entrepreneurs in general and Pakistani entrepreneurs in particular. This investigation is focused to study entrepreneur passion as a trait if it can bring innovativeness in products and services in the organizations.

Performance outcomes are essential for ventures, entrepreneurs, and their stakeholders. Passion and outcomes are complementary to each other; entrepreneurs' passion drives outcomes to venture, and performance outcomes and its knowledge energize passion to deliver (Gielnik et al., 2015). The study of an entrepreneur's passion is the subject taking an interest researchers to find the particular behavior for those outcomes which can bring performance. However, knowledge of passion implications on venture performance is still lacking in the extant literature (De Mol et al., 2020); this gap is served in this investigation to identify how passion can bring product and service innovativeness by an entrepreneur. The trait of entrepreneur passion which can bring product and service innovativeness is also not yet well researched and hence this research will also serve the purpose of examining this gap. For the long-term survival and profitability of SMEs, they need to bring innovation to their current products and services. Limited studies are found on this topic where the author attempts to determine the role of effectuation as a mediator for product and service innovativeness of micro small and medium enterprises (MSMEs). This study is unique to examine the entrepreneurs' trait of passion for product and service innovativeness, with the mediating role of the effectuation process.

In order to develop a theoretical understanding of the process of how product innovation describes in micro and small firms, this study uses effectuation theory, which emerged in entrepreneurship studies (Sarasvathy, 2001, 2008). The theory suits the innovation situation. The data is collected from micro and small and medium enterprises that have limited resources and work in an uncertain environment, and the theory of effectuation is workable in a resource-constrained environment. The effectuation theory is workable to environmental opportunities as they arise, while facing a highly uncertain situation of building new enterprises and innovation, uncertainty is clear and entrepreneurs identify their goals as they arise. Effectuation is interrelated to corporate performance in the perspective of innovation (Brettel et al., 2012) effectual logic requires entrepreneurs to arrange means and congregate constraints to generate new markets (Brettel et al., 2014).

Effectual strategies are appreciated in an uncertain environment where the future is unpredictable, aims are blurred and the environment is determined by human action, Causal methods are appreciated when the future expectations are certain, purposes are obvious and the environment is self-regulating by our actions (Sarasvathy, 2009). The causal approach had a future in mind and gather resources to create that effect. On the other hand, the effectual approach is initiated with the means in hand. Without prediction of the outcome, the effectuation logic seeks what this means can tentatively bring and then go for the processes available in the effectuation model. Sarasvathy and Dew, (2008) were of the view that the effectuation deals with the components of the cake and what it *could*, *should*, and *would* be.

Effectuation entails a paradigmatic shift in the way that we understand entrepreneurship Perry, et al. (2012). Researchers are developing entrepreneurial theories' for years and found effectuation and entrepreneur bricolage theories as a decision-making logic under ambiguity more effective than a traditional rational model of entrepreneurship (Fisher, 2012). Ventures using their means effectively to accomplish their customers' needs using effectuation logic have an edge over others (Matalamäki, 2017). Effectuation logic is not uni-directional. It initiates from entrepreneurial traits and their knowledge and afterward their networks fulfilling what and who they know Andersson (2011). Keeping the arguments forwarded by the authors discussed above this study proposes the theory of effectuation as an underpinning theory of

this study. In this study following research question is addressed: How can an entrepreneur bring product and service innovativeness by applying the process model of effectuation through available means.

2. Literature Review and Hypotheses development

2.1 Product Innovativeness

Innovational outcomes may be either evident (new-product development, or existing-product improvement), or undistinguishable (processual improvements for increasing efficiency). Innovation can be a cause of competitive gain for businesses, either through the development of approaches (i.e. dell incorporation) and techniques capable of generating new products or services or perfecting existing ones (Taques, 2021). The dynamic change in the business perspectives and the user demand worldwide increase the significance of innovation in the small and medium enterprises (SMEs) to survive locally and in the international marketplace (Kiani et al., 2020).

Innovation is becoming a model for success for organizations, and this is taking a surge in research about its antecedents and the behaviors required to innovate in an organization (Kiss et al., 2020). There is an enormous increase in the demand for product or service innovation in the global market and among the research scholars Kiss et al. (2020). Extant literature on entrepreneurs' passion recognizes its effect on firms' innovation (Kiani, Yang, Ghani, & Hughes, 2021). Innovation whether product, service, or process is always a domain of an individual or a team conveying an innovative idea and executing it beyond its original state (Cai et al., 2021). Innovativeness is the propensity to upgrade the creative activities of the firm for the growth of inventions of products, services, and technologies Lumpkin and Dess (1996). Innovativeness encourages the organization to dedicate activities to the novelty of product development and technological innovation and hence increasing the firms' capacity for technological innovation (Cai et al., 2021). Innovation is one of the pivots of entrepreneurial research, as self-determining entrepreneurs account for the most fundamentally unique product offerings (Marvel et al., 2020).

However, there is still not enough understanding of how and when entrepreneurs' passion promotes firm innovation (Cai et al., 2021). This study investigates to fill this gap of how founders' passion relates to taking advantage of product and service innovation in new ventures.

2.2 Entrepreneurial Passion (EP)

The notion of entrepreneurial passion is exclusive as it is snarled to entrepreneurial actions such as inventing, founding, or developing a venture (Cardon et al., 2013). Passion is vital in entrepreneurship because entrepreneurial actions entail complex determination in potentially hostile, traumatic, and volatile situations, and complex and more constant resolve to supplementary task activities (Baron, Franklin, & Hmieleski, 2016) in the absence of passion the stress factors demotivate an entrepreneur to deliver consistent performance and tolerance to mistakes in order to innovate and sustain any business activity.

Entrepreneurs' passion for *inventing* displays encouraging effects through recognizing and discovering innovative prospects and evolving novel products and services (Breugst et al., 2012). Passion for inventing is dedicated to creating innovative products and innovations (Hubner, Baum, & Frese, 2020). Research has found passion to be a precursor and causal in nature it stimulates other entrepreneurial activities including innovation (Cardon et al., 2009). This study replicates (Cardon et al., 2009) description of Entrepreneurial Passion: "consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur".

The objective of passion for which an individual bears arduous affirmative sentiments refers to the entrepreneurial processes that include; creating innovative products and services; the

formation of novel establishments and the evolving these establishments working for their long-term growth and survival Cardon et al., (2013). The desire of entrepreneurs for inventing focuses on new products and market opportunities by scanning the situation, trials with new samples and prototypes, and evolving new products and services (Cardon et al., 2009). Passionate entrepreneurs are more creative than their counterparts in inventing. They got a dominant aspiration for generating new products and services and discovering solutions to the vital needs of the problems (Cardon et al., 2013).

Cardon et al., (2009) EP comprises extreme affirmative spirits and communicates self-efficacy it is the harmonizing or multiplicative association amongst strong encouraging feelings and the distinctive significance of a precise entrepreneurial role that makes up role-based passion (Cardon et al., 2013). Cardon, Wincent, et al., (2009) discriminate three diverse categories of EP. *Inventing* passion plays a different role in comparison to others aspects of passion which advocate for actions connected to recognizing, creating, and discovering innovative prospects. However, passion for *founding* is an altogether different construct it reveals a passion for actions involved in founding a business for commercializing and developing prospects that take the enterprise to next level. Lastly, *developing* passion replicates their passion for actions after its establishment to connect to foster, increase, and grow the business and take the enterprise one step further ahead of inventing and founding. This research has taken all three constructs of an entrepreneur's passion to find out its effect on effectuation and innovation.

2.3 Effectuation

This process model of effectuation informs the readers that the entrepreneurial teams start a shared action for shared gains for the participants of the team who have resolved an issue; or by creating effectual opportunities i.e. networking, affordable loss, etc. so as to make the common pool of resource which are sustainable and productive (Sarasvathy & Ramesh, 2019). Sarasvathy was of the view that an entrepreneur needs to be dynamic and flexible to take decisions according to the situation. Decision-making is a complex subject and an entrepreneur needs to be sensitive to their environment to take a logical shift in his/her decision if the need arises. A new venture requires more energy to decide as it is a new experience and the entrepreneur need to be flexible and collaborative in the early years of venture creation. However, in later years when the business attains some maturity, the entrepreneur needs to shift towards a more planned approach Sarasvathy (2001). Effectuation evidently has a position in literature as the most important decision-making device for entrepreneurs operating in uncertain environments (Pfeffer & Khan, 2018).

Given the intrinsically procedural and probably effectual environment of entrepreneurship, any evaluation of entrepreneurial objective should be likewise processual and effectual. And consequently, it is argued that individuals do not figure out a single goal to progress through all steps of the entrepreneuring process without modification. Rather, they form goals to simply take one step in advance at a time, to gain knowledge from that, and to re-evaluate their objectives and tactics. Doing business is not do or die, everything or nothing. Instead, an entrepreneur takes a calculated risk, assesses the outcome of the previous decision, and then takes a step forward (Valliere, 2015).

Effectuation procedures are constructed keeping in view entrepreneurs' trialing, within your means loss, flexibility, and pre-commitments. The research concludes that, with the elimination of within-your-means loss, effectuation procedures exercise a positive effect on the diversification–performance relationship (Deligianni et al., 2017). Effectuation has a different philosophy entrepreneur start with their feet, assesses the current situation and finds the possible options available, and carves out a future for their business. In effectuation decision-making process ensures real options and expectations, it will bring new concepts, and new scenarios and in turn will bring new inferences to take effective decision measures. On the

other hand, the causal approach takes a reverse perspective it took into account the final outcome first and then reverts to some achievable initial steps (Valliere, 2015). To manage the opportunity the focus should be on competence instead of ends (Read, 2011). Effectuation is the most overriding decision-making approach in both uncertain and risky situations until the entrepreneur ensures precisely how a future is (Welter & Kim, 2018).

On the contrary, the strategies based on the positioning side require the entrepreneur to a) require previous data of similar situations to forecast the future prospects. b) Entrepreneur expects the future to be similar to the past as the forecast is based on previous data. The effectual principle of design directs the entrepreneur to incorporate the impact of their efforts on the ultimate outcome of the environment (Read et al., 2009). Resources empower the entrepreneur with the foundation for future course of action, anticipating the emerging prospects from the information, acquaintances, and resources available. Networks allowed the entrepreneur to en-cash the emerging opportunities because of additional resources bring forth by new acquaintances. Loss within means empowers the entrepreneur to take risks so that the opportunity will not end up in disaster (Read et al., 2009).

Effectuation provides a liaison between entrepreneurs and the network community to create opportunities instead of finding them (Read et al., 2009). Keeping in view of loss within means the entrepreneur ensures the continuity of its business by investing in bite-size chunks. In a hostile environment, the effectuation discusses it with his/her business partners or network community for guaranteed and steady future sales and in this way, it can manage the unexpected future (Harms & Schiele, 2012).

2.4 Entrepreneurial Passion and Product Innovativeness

Toth, Heinänen, & Puumalainen (2021) the passion for inventing, in comparison, depends less on the context than the two other forms of passion, that is; founding and developing. These two forms are more directly linked with new venture creation. As the purpose of this research is to scrutinize the impact of passion on innovation so it has a special focus on this construct. There have been several real cases (i.e. Sir Richard Branson, Steve Jobs, etc.) about the significant part of entrepreneurial passion in firms' innovation and it is considered to be fundamental to entrepreneurship (Luu & Nguyen, 2021). As entrepreneurial passion is progressively considered to be vital to actually innovating firms, it is imperative for entrepreneurs to recognize how their passion energizes the organizational operation or strategies, especially innovation strategies.

Cardon et al. (2013) establish a strong connection between the passion for inventing and founding and the creative behavior of the entrepreneur. To our understanding, Limited work has been done on these lines of how passion can effect effectuation the model proposed by (Sarasvathy, 2009) and its impact on product innovation. Passionate entrepreneurs are inspired to conduct themselves according to their distinctiveness. Especially, allowing passion as a domain-specific notion, entrepreneurs who are obsessive about developing (or inventing) would act according to their distinctiveness. Therefore, the entrepreneurial passion for development reaps radical innovation, and the entrepreneurial passion for inventing promotes incremental innovation and ultimately increases venture performance (Lee, et al., 2021). Studies found a link between entrepreneurial passion and the creativeness and innovative behavior within the organizations that are entrepreneurial in nature (Newman et al., 2021). Moreover, the social cognitive theory (Bandura, 1986) proposed understandings that have not yet been comprehensively assimilated into the research on passion. Social cognitive theory reiterates that entrepreneurial passion can be regarded as an *affective inclination* that inspires entrepreneurs to employ time and effort towards entrepreneurial activity.

This research had identified this gap in the literature as not enough work is carried out to find the relation between entrepreneurs' passion for effectuation and innovation. Therefore, we hypothesize that:

H1: Entrepreneurs' passion has a positive effect on product and service innovativeness.

2.5 Entrepreneurial Passion and Effectuation

There is a strong link between an entrepreneur's passion, effectuation, and organisational network creation. Increased relation amid entrepreneurs' passion, effectuation, and organisational networking construction is one of the ingredients of effectuation; there will be a stronger link between effectuation and organisational opportunity shaping. It is suggested to entrepreneurs to apply the model of effectuation in the fluid environment to encourage opportunity shaping. Effectuation augments the research of causes and consequences of organisational network construct and opportunity-seeking (Lihui & Biao, 2021).

This research had summarized the above-mentioned ideas and found effectuation as an effective mediator to innovation and an antecedent mentioned above to innovation. This study empirically observes the processes and the conditions of the effects of passions of the entrepreneurs with regards to the innovation outcomes by adopting the process approach of effectuation; the theory of effectuation proposed by (Sarasvathy, 2008). This research outlays the approach for an enhanced understanding of the reasons how entrepreneurial passion contributes to firm performance by using the process approach of effectuation. Therefore, we hypothesize that:

H2: Entrepreneurs' passion has a positive effect on Effectuation.

2.6 Effectuation and Product innovativeness

The theory of effectuation has a special place in the innovation process in new businesses with resource constraints and a high extent of uncertainty (Berends et al., 2014). There are gaps in research that exist around the use of experiments as a tool for innovation and corporate entrepreneurship in conventional firms. Experimentation an element of the effectuation process is becoming increasingly popular to gauge users' insights and to innovate. There is a dearth of research evidence on the various challenges that organizations face in using experimentation in innovation, the strategies to overcome these challenges, and the restrictions on the application of experimentation in the firms (Hampel, 2020).

In order to attain sustainability a prerequisite to survive in the long run is innovation and for this reason, experimentation can be perceived as a methodical approach for entrepreneurial innovators to gain knowledge of future prospects and how they may utilize them. In entrepreneurship, experimentation has surfaced as the core basis for one of the most significant approaches to introducing new ventures (Hampel, 2020).

Experiments produce statistics that entrepreneurs can exploit to examine the impact of their results. Experimentation also lets entrepreneurs generate prospects in the course of early stakeholder participation. Experimental learning support intent-formed experiences (experiments). These experiments focus on information about states (for example, customer needs) and the interrelationships (for example, problem-solution fit). Entrepreneurs can scrutinize and reflect on the outcomes of their experiments Harms (2019).

The effectuation process further provides solutions to maintain sustainability challenges of the environment, especially working in isolation is challenging to contribute towards a better environment for the future generations. Carlsberg wants to contribute to environmental protection but does not want to get involved in non-core activities by investing its resources in the packaging business. They encouraged the existing packaging business companies to

develop an innovative practice for manufacturing environmentally sustainable packaging without spending directly on the businesses. However, Carlsberg was ready to share its technology and packaging expertise and further to that provide a guarantee to be the buyer of their innovative and environment-friendly packaging. Hence, Carlsberg becomes a potential partner not in innovation but as a resource generator and a customer (Bogers, & Strand, 2020) and thus fulfills the element of the effectuation process. Therefore, we hypothesize that:

H3: *Effectuation has a positive effect on Product innovativeness.*

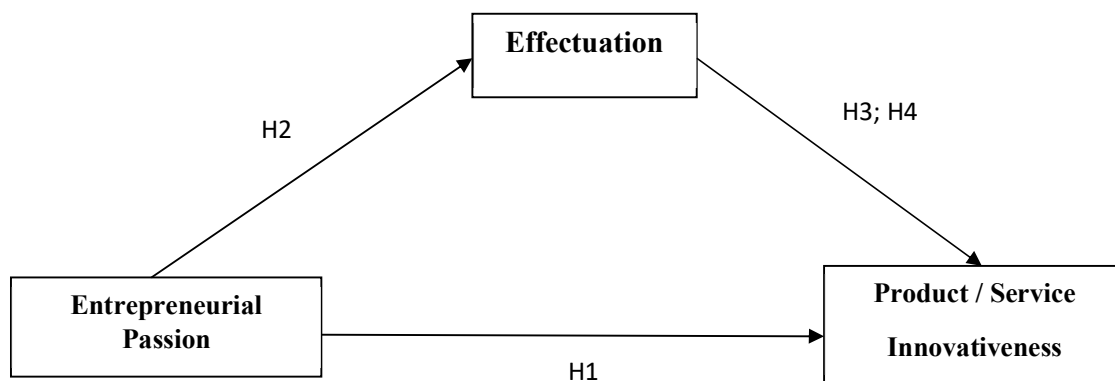
2.7 The Mediating Role of Effectuation on Entrepreneurs' Passion and Product Innovativeness

Causation-effectuation strains at the *inter-organizational level* stem from the diverse operational styles of entrepreneurial start-ups and additional players (e.g., funding institutions, accelerators, and entrepreneurial incubators). In this respect, the functioning style that is rooted in the cause is connected to the organized task, where projections are prepared and business strategies recognized and permanent (e.g., in business incubators). On the other hand, the effectual functioning style is linked to experimenting and inventing in start-up firms that are flexible to evolving prospects (Galkina, Atkova, & Yang, 2021). Organizations experiment with diverse intentional options and study the results of such experimentation (Cui & Wu, 2017).

De Mol et al. (2020) stipulates that Entrepreneurs' Passion has vital significance for judgment and decision-making. Therefore, we theorize that Entrepreneurs' Passion can give increase effectuation and set its strategic intent, where Effectuation subsequently mediates the relationship between Entrepreneurs' Passion and Product innovation among SMEs. This researcher identified a gap in entrepreneurship literature between entrepreneurs' passion and effectuation as not much literature is found on the relationship between passions with effectuation. Therefore, we hypothesize that:

H4: *Effectuation positively mediates the relationship between Entrepreneurs' Passion and Product innovativeness*

Figure 1. Theoretical framework



3. Methodology

3.1 Research Design

An explanatory research design has been chosen for this quantitative study. It has been conducted in a non-contrived setting it is a causal and cross-sectional study using a survey-based instrument to measure the relationship among the research variables.

3.2 Sample and Data collection

The study involves MSMEs of Pakistan. Every owner and principal worker who is involved in innovation and decision-making in MSMEs is the unit of the sample of this research. The data from 306 respondents were collected between June and September 2021 using an online questionnaire that was sent to the owners or experts employed in MSMEs and technology firms located in the Islamabad Region of Pakistan. The samples were chosen by using the purposive convenience sampling technique as suggested by (Sivathanu, 2019). Field visits had also been made to the technology firms located in-house at the university incubation centers and science and technology parks of several universities of Islamabad i.e. NUST, COMSATS, Bahria, etc. Visits were also made to business houses having in-house enterprises located in different areas of Islamabad including the National Incubation Center. The initial response was low however after field visits were made and physical questionnaires were distributed which assisted this research to increase the reach of the author to collect data from up to 306 respondents. Two hundred and twelve respondents were online and 94 respondents filled the questionnaire physically. The respondents were considered appropriate for the study as they were the principal staff members, owners, or decision-makers of the MSMEs.

3.3 Measures

All the constructs were measured on multi-item 5-point Likert scales, unless otherwise indicated, based on existing tested scales from previous research.

3.3.1 Entrepreneurial passion (Independent Variable)

Existing measures of constructs were used. Entrepreneurial passion was measured using the scale adapted from Cardon et al. (2013). In order to measure entrepreneur passion, all the three elements of Entrepreneurial passion are taken together for analysis. Reliability statistics of founding passion - Owning my own company energizes me ($\alpha = 0.87$); Reliability statistics of inventing passion- I am motivated to figure out how to make existing products/services better ($\alpha = 0.87$); and Reliability statistics of passion for developing firms- I like finding the right people to market my product/service to ($\alpha = 0.87$). Participants responded to all measures on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree) and reliability for the construct was analyzed by using SPSS version 25. The study sample was collected from owners and at the senior management level of startups and established firms.

3.3.2 Product innovativeness (Dependent Variable)

Prevailing measures of constructs were used and this study benefitted from the scale used by (Cui & Wu, 2017). Reliability of the five-item scale of product innovativeness 'Very novel for the industry' ($\alpha = 0.81$). Reliability of the Product innovativeness was taken on 5 items as shown in table 1. All the items have acceptable reliability as more than 0.7 is considered to be good where it is considered internally consistent and the results are seventy percent accurate, whereas the reliability of product innovativeness is 0.81 which is also acceptable.

3.3.3 Effectuation (Mediator)

This study aims to better understand the contribution of effectuation as a mediator on product innovativeness, existing measures of constructs were used and effectuation was measured by

using a scale adapted from Chandler et al., (2011). Reliability Statistics of Effectuation is measured by 15 items of effectuation. Reliability of fifteen item scale of effectuation ($\alpha = 0.87$).

4. Results

4.1 Reliability Statistics

Figure 2. Reliability

	Variables	No of Items	Cronbach Alpha
1.	EP	13	0.87
2.	PI	5	0.81
3.	Effect	15	0.87

4.2 Common method Variance

The study used pretested instrument to collect the data for analysis. However, validity and reliability both are conducted in order to find out if there is an issue with the data. It is found that data does not carry any issues of validity and common method bias and variance do not occur all the values of variance are less than 50 see figure 3. Hence data is fit for analysis.

Figure 3. Total Variance Explained

Extraction Sums of Squared Loadings		
Total	% of Variance	Cumulative %
8.764	26.556	26.556

4.3 Control Variables

Several control variables were included in this study as shown in table 2 that may affect product innovativeness: firm age- measured firm age using the number of years since firms were founded. Firm size is measured as the number of employees which reflects if it is a micro organization or a small and medium enterprise 42% of the firms were micro organizations having less than ten (10) employees, 27% are small enterprises having less than 50 employees and 13% percent respondents belong to medium size organizations.

Enterprise industry is also an important area of study to find in which industry where innovation is taking place-industry (1= Information, communication Technology (ICT), 2= Manufacturing/Chemical/Process Engineering, 3= Education/HR/Training/Consultancy, 4 = Transport /logistics, 5 = Energy/Alternate energy, 6 = Healthcare/Pharmacy/etc. 7= Food and Beverages, 8 = Services sector, 9 = Not for profit organisation, 10 = Garments/Textile/Apparels, 11 = Trading/Export/Import, 12=others). 40% respondents belongs to ICT and 38% belongs to manufacturing and 11% belongs to education and training. At the individual level, for respondent's age (25% = upto 25 years of age, 40% = upto 35 years, whereas, 20% = 45 years). Gender (1 = male, 2 = female), In terms of gender, 26% were male and 56% female rest did not report.

Education level (1 = up t 12 years of education, 2 = upto 16 years of education, 3 = upto 18 and more).The highest education level obtained for respondents was 47% up to high school or less, 14% held bachelor's degrees, and 18% held master's degrees or more. 56% of the respondents were owners and/or founders, 25 % of the respondents were executive level, and 8% of the respondents were general managers who could influence or make the final decision on their firms.

Figure 3. Descriptive Statistics

		Frequency	Percentage
1. Gender	Male	82	25.5%
	Female	178	55.5%
2. Age	Upto 25 years	81	25.2%
	26 to 35 years	135	42.1%
	36 to 45 years	66	20.6%
	46 to 55 Years	11	3.4 %
	55 and more	11	3.4 %
3. Education	Upto 12 years of education	150	46.7%
	14-16 years of education	46	14.3%
	18 or more years of education	59	18.4%
4. Experience	Upto 3 year	178	53.8%
	4 to 6 years	58	18.1%
	7 to 10 years	37	11.5%
	11 and more years	21	6.5%
	Information and Communication technology	127	39.6%
5. Industry	Manufacturing	122	38.0%
	Education, training and consultancy	36	11.2%
	Transport and Logistics	1	0.3%
	Health care and Pharmacy	16	5.0%
6. Firm Age		135	42.1%
	Upto 3 year	91	28.3%
	4 to 6 years	39	12.1%
	7 to 10 years	41	12.8%
	11 and more years		
7. No. of Employees		136	42.4%
	Up to 10 Employees- Micro Organisation	88	27.4%
	11-49 Employees Small Enterprise	43	13.4%
8. Designation		179	55.8%
	51-250 Employees Medium Enterprise		
	Owner/ partner	79	24.6%
	Executive level	27	8.4%
	General Manager	14	4.4%
Functional Manager	6	1.9	
Front line Manager			

4.4 Regression and correlation

This research used the Andrew Hays process model 4 to run the mediation analysis as shown in Figure 4. Bootstrapping does not require specific assumptions to accept sampling distribution when conducting inferential tests and thus, bootstrapping is more feasible now than in the past (Hayes & Scharkow, 2013). This process made it more effective than other soft wares. Mediation and moderation can be exhibited in diverse ways whereas, bootstrapping is a strategy of resampling estimation and hypothesis testing (Preacher, 2007). A statistically significant indirect effect (t -value > 1.96 , two-tailed, $p < 0.05$) should be taken as an evidence for mediation (Preacher & Hayes, 2004; Zhao et al., 2010).

Analysis of the results reveals effective results of the data; R-square (.27) is positive and significant and all the results have significant P values of 0.000 and the T-test is also more than 1.96 means the results are significant. R square is significantly greater than zero and has a

significant effect of independent variable entrepreneur passion on dependent variable product innovativeness. Results state that the predictors can affect a significant amount of variance to the outcome variable innovativeness and can be said that the regression model is significant as all the variables have significant P values and the regression model is fit for prediction.

The correlation figure 4 shows the variables are correlated and also show higher values as EP to effectuation is 0.473** and to product, innovativeness is 0.467** whereas, the correlation of effectuation to product innovativeness is also 0.431** and significant; resulting in a unique variance to the outcome variable. In another case, if the results of the correlation are one then it means it is not offering anything uniquely what is offered by passion is similar to what is offered by effectuation.

Figure 4. Correlations

Scales	1	2	3
1 Entrepreneur Passion (EP)	0.87		
2 Effectuation (Effect)	0.473**	0.87	
3 Product Innovativeness (PI)	0.467**	0.431**	0.81

N=306, **. Correlation is significant at the 0.01 level (2-tailed). Note. * $p < .05$, ** $p < .01$
Alpha reliabilities are given in the diagonal.

In the Regression coefficient figure 5, we can examine that the value of P is significant when passion is regressed with effectuation and product innovativeness. The value of P becomes significant when it is predictor passion is regressed with the mediator effectuation. Further to that, it is showing positive signs of LLCI and ULCI remain positive in other words it is going in a similar direction reflecting that there is a considerable amount of variance in the case of mediation and this model is fit for interpretation.

The results of the direct effect of Entrepreneur Passion on Product Innovativeness is significant at 0.4008 with a significant P-value and lower level of confidence interval (LLCI) and upper level of the confidence interval are positive and in the same direction. The results of EP on mediator effectuation are significant and show a different value of 0.4425. It shows the indirect effect of EP is 0.1529 on Product innovativeness. The results of the direct EP coefficient are 0.4008 and the indirect effect of EP is 0.1529. Whereas, the total effect is increased to 0.5537 the results are significant at a confidence level of 95%. The mediation results show that there exists a strong relationship between entrepreneur passion and effectuation on product innovativeness.

The results advocate that all the hypotheses are accepted; H1: Entrepreneurs' passion has an effect on product innovativeness. H2: Entrepreneurs' passion has an effect on Effectuation. H3: Effectuation has an effect on Product innovativeness and lastly H4: Effectuation mediates the relationship between Entrepreneurs' Passion and Product innovativeness.

Figure 5. Regression Analysis

Sr. No	Variables	B	SE	T	P	Boot LLCI	Boot ULCI
1.	Total effects	.5537	.0610	9.0822	.0000	.4337	.6736
2.	Direct effect	.4008	.0667	6.0066	.0000	.2695	.5321
3.	Indirect effect	.1529	.0437	3.4500	.0000	.072645	.2428

5. Discussion

Effectuation prompts inventive and transformative procedures and is a more exploratory and vibrant approach. Organizations should validate their decision-making logic to effectuation when realizing business model innovation (BMI) to overcome the uncertainty (Brenk et al., 2019). Berends et al., (2014) suggested effectuation theory assisted in understanding how small firm product innovation both resembles and differs from NPD best practices observed in larger firms. The dynamic model of effectuation makes it specific for product innovation in small firms.

Effectuation has a strong impact on product innovativeness if it is in conjunction with Entrepreneurs' Passion. This is a unique study of its kind as very scant studies are found using the EP on Effectuation. The results show that this model if applied effectively can bring innovations in entrepreneurship. The study is in line with the above studies of (Brenk et al., 2019) and (Berends et al., 2014) where the authors had suggested using principles of effectuation to bring product and service innovation to the organization. Most of the innovations are carried out by young entrepreneurs who are short of resources this study can assist them in how to use all the means an entrepreneur got to use effectively to bring product innovativeness through effectuation. Effectuation is very effectively used by entrepreneurs practically. However, not well understood at the Academic level there is a dearth of research that needs to be carried out in this field and needs to be understood by the faculty and researchers to apply this model. Pakistan is also one of the countries which scored very low in innovations as per the study conducted by the Global Entrepreneurship Program (2021) hence, can utilize the model of effectuation in order to bring more innovations.

Sustainability concerns are becoming more pressing for the new enterprises and in order to overcome sustainability; innovation is considered to be a benchmark as without innovation sustainability is a dream. As per the GEM report of 2021, Pakistan is among the bottom six countries globally where innovation is not a part of business and social enterprise. This research delves into the above idea of innovation through the passion of a leader. The research comes to the conclusion that the role of passion is multiplied with effectuation, especially for nascent enterprises, the results of this study show mediation of effectuation with passion and innovativeness.

This research identified the approach suggested by (Sarasvathy, 2009) of using the process variable of effectuation as a mediator which means only characteristics of entrepreneurs 'passion cannot bring results. There needs to be a process mechanism of success available to every entrepreneur. Effectuation plays a vital role to bring innovation to products and services. The study advocates that effectuation fully mediates the relationship between passion and innovations. The study also validates the results of previous authors (Alzamora-Ruiz et al. 2021, etc.) who advocated the model of effectuation for bringing successful innovation by using effectuation. The relationship of EP to effectuation is not widely studied. (Qian et al., 2021) state EPs for inventing and for founding are significantly related to entrepreneurial behavior which endorses the results of this study where EP is an antecedent to innovativeness which is the outcome of entrepreneur passion. The study further substantiates the theory of effectuation (Sarasvathy, 2008) in relating EP with behavioral outcomes. The findings of this study unveiled the behavior of entrepreneurs' passion for innovation. The positive effect of EP in terms of inventing and founding was related to growth aspirations and self-incentive behaviors for founding a new firm (Qian et al., 2021).

Considering the details of regression analyses provides new insights into the role of effectuation in the context of entrepreneur passion. The study provides guidelines to individuals on the path of innovation to use the model of effectuation for innovation and ultimately

sustainability. The approach adopted by this research disputes the only role of the entrepreneur in the process of innovation single-handed. It does not attribute specific characteristics or technical skills of the entrepreneur required only for innovation. As an alternative, it recognizes innovation as a process that envisages all stakeholders who are willing to be part of the effectuation process. The model makes the process of innovation more dynamic and affordable as an entrepreneur should make a pool of resources in order to make a product or service innovation with the help of multiple stakeholders.

5.1 Limitations and future research

This study is subjected to several limitations and thus provides avenues for future research. To start with; passion is considered a multifaceted variable. Its different dimensions have different roles and can produce diverse results. This study took passion as one variable to identify how compositely it can produce outcomes of product and service innovativeness. Future research can be taken to identify how each dimension influences the outcomes of the product and service innovativeness. There are certain insights that cannot be gauged in quantitative settings as everything is measured quantitatively. Future research can be conducted to find insights into the entrepreneur's passion in qualitative settings.

Effectuation is a construct having several dimensions and can bring diverse results. Few authors, for example, found the results of affordable loss (Read, 2009) are not synchronized with other dimensions. This study took all the dimensions of the effectuation process in unison and thus cannot gauge the individual role played by different constructs. Future studies could split all the constructs and identify the role of individual constructs and how they can bring product and service innovativeness.

5.2 Academic and Practical Implications

Effectuation is not a unique concept in practice and it is being used by entrepreneurs for a long. However, in our academic institutions, it is still a very new concept. Most of our faculty because of their awareness of the model of cause only still believe that without resources you can neither innovate nor become sustainable. This scholarship is an empirical study and addition to the existing literature to prove the success of the model of effectuation by (Sarasvathy, 2009) for innovation. The results of the current study prove the utility of the process of innovation as it fully mediates the relationship between passion and innovativeness. The results revealed that the model of effectuation should be incorporated into the entrepreneurship syllabus and students must be taught and guided to start their business by taking guidelines from the effectuation process. It can be a useful guideline for the faculty of entrepreneurship to integrate the model of effect into their teaching curriculum.

The empirical data shows that this model is very practical and also quite a vogue in the business field lot of people are using this model already. New knowledge will be added to use this model in academia. The model can be used by new and resource-constrained entrepreneurs to get benefits from the network of resources provided by the framework of effectuation. Future research can be conducted by splitting the variables of passion and effectuation to find how the construct behaves individually if it is measured in isolation with other constructs of the same variable.

The research findings will assist the micro and SME owners and managers as they will be able to understand how entrepreneurial passion with the help of the effectuation process positively influences product and service innovation. This study will include the body of existing knowledge, make an empirical contribution and attempt to bring an understanding of how micro and small and medium enterprises in Pakistan can follow the principles of effectuation and of entrepreneurial passion for product and service innovativeness.

Based on the findings with respect to the proposition of the study, a key conclusion from this empirical research is that effectuation theory worked very well in the case of product and service innovativeness. All effectuation elements (experimentation, flexibility, network, etc.) significantly predicted the innovation outcomes. The theory of effectuation is a relatively new concept, especially in Pakistan. Most entrepreneurs are taught to have resources before they can start any venture or innovation. This theory negates this impression and states if you got the passion to start a business or seek product and service innovation, then the theory of effectuation provides the framework to start working on your innovative ideas with the resources you have and add what is required with the resources you need with the help of the other stakeholders you can have.

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Appendix

Scale effectuation: (1=strongly disagree; 7=very strongly agree), Cardon, et al.,(2013).

Experimentation

E 1: We experimented with different products and/or business models.

E 2: The product/service that we now provide is substantially different than we first imagined.

E 3. We tried a number of different approaches until we found a business model that worked.

Affordable Loss

4. We were careful not to commit more resources than we could afford to lose.

5. We were careful not to risk more money than we were willing to lose with our initial idea.

6. We were careful not to risk so much money that the company would be in real trouble financially if things did not work out.

Flexibility

7. We allowed the business to evolve as opportunities emerged

8. We adapted what we were doing to the resources we had.

9. We were flexible and took advantage of opportunities as they arose.

10. We avoided courses of action that restricted our flexibility and adaptability.

Pre-commitments & Strategic alliances

11. We used pre-commitments from customers and suppliers as often as possible

12. We used a substantial number of agreements with customers, suppliers and other organizations and people to reduce the amount of uncertainty.

13. Network contacts provided low cost resources.

14. By working closely with people/organizations external to our organization we have been able to greatly expand our capabilities.

15. Our partnerships with outside organizations and people play a key role in our ability to provide our product/service.

New product innovativeness; Cui & Wu (2017).

1. Very novel for your industry.

2. Challenging existing ideas in your industry.

3. Offering new ideas to your industry.

4. Highly creative.

5. Very interesting.