

# A MODERATION APPROACH TO ONLINE SOCIAL INTERACTION IN ENTREPRENEURSHIP USING THE EFFECTUATION AND CAUSATION THEORY

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## Abstract

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Recently, there has been a growth in digital technology use and social media adoption by individuals, including entrepreneurs, that has changed the way individuals and businesses communicate and interact (Chatterjee & Kar, 2020; Harrigan, Miles, Fang, & Roy, 2020). Despite this, little is known about how the adoption of online social interaction affects entrepreneurial processes, especially opportunity evaluation. Through a moderation approach, this empirical study sought to fill the gap by investigating the effect of social interaction via social media on opportunity evaluation, specifically if the effect of online social interaction on opportunity evaluation depends on effectuation and causation. Using a quantitative method approach, survey questionnaires were used to collect data from a random sample of young entrepreneurs in Ghana. The questions were evaluated with SPSS and later exported to STATA for data analysis. A total of 383 questionnaires were analysed. The study found that the interaction effect from the linear regression model showed that although there is a positive relationship between effectuation and social interaction, while causation interacts negatively with social interaction, the moderation effects were not statistically significant. It is recommended that future research considers other factors that may facilitate or hinder the opportunity evaluation process and to what extent they do, which may lead to a better understanding of targeting entrepreneurial training.

**Keywords:** Online Social Interaction, Entrepreneurship, Causation, Effectuation, Opportunity Evaluation, Moderation

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## 1. INTRODUCTION

The study of entrepreneurship focuses mainly on creating or finding opportunities with expected

returns and exploiting them (Shane & Venkataraman, 2000). Typically, the entrepreneurial process proceeds through the identification, evaluation, and exploitation of potential opportunities.

An extant body of entrepreneurial literature exists that seeks to explain how individuals identify and interpret potential opportunities (Baron & Ensley, 2006; Cornelissen & Clarke, 2010; Autio, Dahlander, & Frederiksen, 2013; Grégoire, Barr, & Shepherd, 2010; Tang, Kacmar, & Busenitz, 2012). However, opportunities identified do not come fully formed and go through a process of evaluation and refinement (Dimov, 2007; Shepherd, 2015) before eventually exploited. Opportunity evaluation is essential in the study of the entrepreneurship process because an individual takes action in creating a venture in order to produce a good or service only if he is convinced that an imagined future is attractive enough to pursue (Wood & McKelvie, 2015). The opportunity could be one of either or both where an entrepreneur is selecting from various processes and resources in order to obtain a particular effect or selecting among numerous effects using a specific set of resources or processes (Sarasvathy, 2001). This is not done in isolation as entrepreneurs engage other social actors in the process of developing their ideas, simply referred to as a social process of discussion, giving a social view of the entrepreneurial process (Dimov, 2007).

Dimov (2007) indicated to give a deeper understanding of the importance of how social resources support entrepreneurs but only a few studies, such as the study by Fischer and Reuber (2011) has explored the importance of social media in entrepreneurial decision-making. Technology is increasingly becoming part of our everyday lives, where now more than half of the world's population is using the Internet and almost 50% are social media users (Kemp, 2020). The decision-making model of effectuation and causation by Sarasvathy (2001) shows how entrepreneurs make decisions on how to proceed with opportunities. Under effectuation, where entrepreneurs operate under uncertainty, they co-create with their networks (Kerr & Coviello, 2020). The research has also found that the two modes of decision-making are not mutually exclusive but can co-exist and thus an entrepreneur may use the two at the same time. However, how much an entrepreneur may use of each may depend on the actors in the entrepreneur's network (Kerr & Coviello, 2020). Using the network theory and the theory of causation and effectuation, the researchers found it imperative to fill this knowledge gap by using the causation and effectuation theory and the network theory, to investigate entrepreneurial opportunity evaluation using online social interaction to see if the decision-making process an entrepreneur uses affects the use of social media in evaluating opportunities. It was a cross-sectional study conducted in 2019.

This paper is organised as follows. Following Introduction, Section 2 of the paper presents a review of relevant literature that comprises of a review of the theoretical framework, conceptual framework, and empirical review. This is followed by Section 3 that provides methods used for the study, and then Section 4 that presents the results. Section 5 discusses the results. Section 6 the paper draws the conclusion.

## 2. LITERATURE REVIEW

### 2.1. Theoretical framework

#### 2.1.1. Causation and effectuation theories

The process of causation considers a specific outcome and concentrates on choosing between various means to create the desired effect (Sarasvathy, 2001). Entrepreneurs using the causation process have set out clear objectives and actively search for resources to meet these set objectives (Fisher, 2012). A considerable amount of works in entrepreneurship has theoretical fundamentals in the causation approach (Chandler, De Tienne, McKelvie, & Mumford, 2011).

In the effectuation approach, an entrepreneur considers the availability of a certain amount of resources and then concentrates on selecting between potential outcomes that can be created with a certain group of resources (Sarasvathy, 2001). In this approach, entrepreneurs start the new venture creation with a broad objective of establishing a new venture, but as they progress through the decision-making process, they make use of new information and make modifications to their initial objective (Chandler et al., 2011). Cognitive science lays the theoretical foundations in effectuation especially as it relates to how entrepreneurs put together their thoughts regarding the future as they interact with other actors (Sarasvathy, 2008).

Whether an individual has causation or effectuation goals, evaluation of either means or effects has to take place. Online social interaction provides a bigger and diverse platform to receive information that affects cognition, which plays a central role in opportunity evaluation literature. This theory would help test if the extent of engaging in online social interaction is affected by the choice of the decision-making process that the entrepreneur has chosen.

#### 2.1.2. Social network theory

In simple terms, a network is a set of relationships. It is made up of a set of objects and an explanation of how the objects or nodes are related to each other. The simplest network comprises two objects with one relationship linking them. If there is more than a single relationship, it is known as a multiplex relationship. Relationships are most likely to be more than just sharing one or more attributes. In network theory, flows and exchanges are vital and these usually occur between the objects or the nodes. The depiction of relationships as sociograms allowed observers almost instant insight as to what was going on in small, not over complicated, networks. The addition of graph theory to the tools for understanding networks further allowed for understanding and manipulating much larger and more complex networks. Open systems are networks that do not necessarily have clear boundaries (Kadushin, 2012).

A social network can be described as one or more relations linking a set of socially relevant nodes. Nodes are the elements that are linked by the relations whose patterns are studied. Social relations are usually inclusive of commonly defined

relations, for instance, a friend. Interactions refer to behavioural actions such as talking with someone or inviting someone into one's home. Interactions typically happen within social relations with affective-based measures often used as representations for each other (Scott & Carrington, 2011).

The social network theory would help provide a deeper understanding of the part that networks play in entrepreneurship and understand how these networks affect entrepreneurial processes including opportunity evaluation whether an entrepreneur is using the causation or effectuation approach.

### 2.1.3. Online social interaction and using the causation or effectuation approach

Sarasvathy (2001, 2008) introduced the notions of causation and effectuation as processes by which new ventures are created. Venture creation is the result of either the discovery or the creation of opportunities. In other words, if there is no existence of an opportunity no ventures would be created. In her work, Sarasvathy (2008) relates causation to a jigsaw puzzle where an entrepreneur uses resources to take advantage of an existing market opportunity and creates a sustained competitive edge over his competitors. Here the world is seen as one having all the pieces readily available and just needs to be assembled the right way to get the expected results (Chandler et al., 2011). Effectuation is related to a patchwork quilt. In this approach, the entrepreneur has to figure out

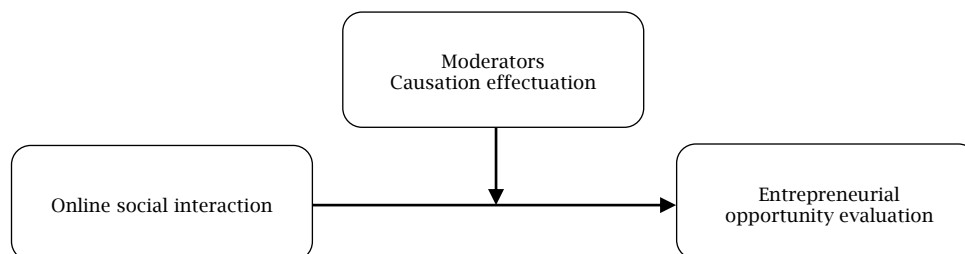
the best way to develop an opportunity by using the information as and when it becomes available. Here the world is seen as still being developed with human action very crucial to this process. Several studies (Fisher, 2012; Harms & Schiele, 2012; Reymen et al., 2015; Laine & Galkina, 2017; Ortega, García, & Santos, 2017) have tested the use of the two processes in decision-making, whether one is used more than the other or one is more effective than another. What has been found is that in the decision-making mechanism there is the interplay of the effectual and causal logic (Kerr & Coviello, 2020). This means that whatever the case is an entrepreneur will use one of the logics or use the two simultaneously and/or interchangeably. Some researchers found that small companies use effectuation at the initial stages of setting up the venture and use causation during the latter stages (Berends, Jelinek, Reymen, & Stultiens, 2014). It is hypothesized that:

*H1: The effect of online social interaction is not the same across levels of effectuation and causation.*

### 2.1.4. Conceptual framework

Based on the study objective and literature, below, as displayed in Figure 1, the conceptual model is to be tested empirically. How much online social interaction that goes on during the evaluation of entrepreneurial opportunities could depend on whether an entrepreneur is using the causation or effectuation approach, with one approach possibly being more prominently more than the other.

Figure 1. Conceptual framework



## 2.2. Empirical review

Initial studies on entrepreneurship focused on the individual doing it all alone (Shane & Eckhardt, 2003; Van de Ven, Sapienza, & Villanueva, 2007). Davidsson (2015) proposed a fixed set of boundaries for a potential opportunity but with the evolution of technology, these boundaries are more flexible as ideas continue to evolve (Nambisan, 2016) making the process non-linear. In other words, with the explosion in the use of technology, this phenomenon has changed bringing to the fore the inclusion of several actors in the entrepreneurial process with these actors having varied goals (Nambisan, 2016). The actors can potentially have an effect on entrepreneurial behaviour and actions thereby affecting outcomes.

In the opportunity development processes, from the view of the opportunity creation literature, ideas are adjusted according to the response received from the market (Alvarez, Barney, & Anderson, 2013). From the narrative perspective, Garud and Giuliani (2013) see opportunity

development as a process that evolves through the interactions of the entrepreneur with other stakeholders.

Firms and organizations, including entrepreneurs, are viewed as social entities and their activities are influenced by society (Huang, Nandialath, Alsayaghi, Emine, & Karadeniz, 2013; McKeever, Anderson, & Jack, 2014). Kuratko, McMullen, Hornsby, & Jackson (2017) in examining the creation of social value by firms emphasize the need to create with the environment in mind, which requires that the environment is monitored to ensure that creation and recreation incorporate social value.

The environment is a source of information and support and hence entrepreneurs seek legitimacy from various stakeholders (Cornelissen & Clarke, 2010; Dimov, 2007; Guerrero, Liñán, & Cáceres-Carrasco, 2020). Social media is a good way of monitoring the environment to create social value as it provides access to real-time diverse information spanning geographical boundaries (Kuratko et al., 2017).

Opportunities and related economic outcomes are seen to be a result of the interaction between the entrepreneur and society as a whole (Garud & Giuliani, 2013; McKeever et al., 2014). However, little is known about specific social processes that enhance entrepreneurial recognition or exploitation of opportunities. For instance, the social context exposes a nascent entrepreneur's idea to a wider frame of reference, which can be either nurturing or supportive (Davidsson & Honig, 2003).

Before the digital age, firms, industries, and other institutions relied on contributions by actors outside their organizations. Technological innovations have increased the adoption of openness as a business principle where these actors are seen as a part of the innovation process in the production of goods and services (Dobusch & Kapeller, 2018). The internet has made it possible to maintain geographically distant relationships enabling access to information in a less expensive and timely manner (Autio et al., 2013). There are new opportunities to create networks due to the emergence of online networks (Song, 2015) which provides individuals with a large network and reduces the cost of searching (Leyden, Link, & Siegel, 2014) and the possibility of finding a better means to implement goals in the midst of several available options (Wang, Van Fleet, & Mishra, 2017). This "openness" has the advantage of creating a greater and novel variety in choices that are available to choose from as well as improving the quality of the outcomes (Dobusch & Kapeller, 2018).

Recent research in entrepreneurship highlights the interaction of the social (intersubjective), the individual (subjective), and the vital role of networks in the entrepreneurial process (Sarasvathy, 2003; Venkataraman, Sarasvathy, Dew, & Forster, 2012; Erikson & Korsgaard, 2016). Some social media activity is such a blend of the virtual and real network element, i.e., the contacts among the network stakeholders transpire both online and in real-time bringing to light the social aspect of entrepreneurship (Gustafsson & Khan, 2017).

Being embedded in a social network has an effect on entrepreneurial cognition and the progress in establishing a new venture (De Carolis, Litzky, & Eddleston, 2009). Entrepreneurs need to be looking for a supportive environment and then gather resources (Mitchell et al., 2002) both from within and outside their environment to enable them to capitalize on an opportunity. Young enterprises, however, do not always have the luxury of easy access to needed resources and have to rely on others to fulfil their venture idea or would have to abandon it completely.

Nascent entrepreneurs use networks for acquiring resources necessary for establishment (Huang et al., 2013) and to enhance one's status and business opportunities (Bellavitis, Filatotchev, & Souitaris, 2017). The locus of an individual within a network impacts the flow of information which is vital in creating innovative ideas (Braun, Ferreira, Schmidt, & Sydow, 2018). The success of an entrepreneur depends on the quality and amount of information he can access (Huang et al., 2013). Therefore, there is a need for entrepreneurs to establish networks that are high in compositional quality, as the networks make it easier to reduce vulnerabilities, resource dependency and to maintain a variety of relationships for increased creativity and

innovation (Sullivan & Ford, 2014; Brinckmann & Hoegl, 2011). Initial networks connect to other networks thereby improving access to additional resources to address evolving resource dependencies, especially during early venture development as different networks provide different resources (Brinckmann & Hoegl, 2011). This enables entrepreneurs to pursue opportunities beyond the resources that are under their control.

In summary, networks aid in making more apparent to the entrepreneur the existence of novel opportunities, shows the existence of solutions to problems, and makes potential partners more evident (Braun et al., 2018). The deepening of ties is important for innovation (Braun et al., 2018). However, the general existence of a relationship does not automatically create an exchange of resources (Semrau & Werner, 2014) and hence the need for a deliberate effort on the part of the entrepreneur to gain access to resources and a variety of exchanges (Sullivan & Ford, 2014) in order to successfully discover input combinations that would produce the desired results (Leyden et al., 2014). The value derived from networks depends on the entrepreneur's ability to assimilate external knowledge (Gruber, MacMillan, & Thompson, 2013). Purely depending on offline friends for capital is not enough. With the fast increase growth in the use of the Internet and social networking sites, it has become imperative to maintain not only offline network relationships but also online ones (Davidsson & Honig, 2003).

### 3. METHODS AND ANALYSIS

#### 3.1. Study design

The aim of this research is to examine if the extent of engaging in online social interaction during opportunity evaluation depends on effectuation and causation. This study used a quantitative cross-sectional design to achieve its objective. The approach allowed the use of a questionnaire to collect data from a population of 918 young nascent entrepreneurs in Ghana who have been in business for not more than 5 years at the time point for analysis. The study population of 918 young nascent entrepreneurs was obtained from the Social Enterprise Ghana (SEG) and the National Entrepreneurship and Innovation Programme (NEIP) that have a large representation of young entrepreneurs from a wide area of disciplines across Ghana.

#### 3.2. Sample size calculation

The Yamane formula was used to determining the minimum sample size required for the study. Therefore, the sample size was calculated using the formula:

$$n = N/1 + N(e)^2 \quad (1)$$

where,  $n$  is the required sample size,  $N$  is the total population and  $e$  is the margin of error (0.05) for the confidence interval of 95%. Based on the population of 918 and applying the Yamane formula above, the minimum sample size required for the study was 275. However, a total of 383 responses were used for the analysis of

the study and this is in line with Boateng, Neilands, Frongillo, Melgar-Quiñonez, and Young (2018) who recommend that to develop a scale a minimum recommended sample should be 300.

### 3.3. Sampling technique

A simple random sampling technique was used for the selection of study participants. Simple random sampling is a basic form of probability sampling and each unit of the population has an equal chance of being included in the sample (Bryman, 2012) and has the highest freedom from bias (Taherdoost, 2018). This sampling technique was used in the selection of the study sample. The simple random sampling method was preferred, as a sampling frame was available and obtained from the SEG and the NEIP. The simple random sampling techniques ensured that each member of the population had an equal chance of being selected and would also avoid researcher bias.

#### 3.3.1. Survey administration

Due to the nature of the widespread location of respondents, the data was collected using telephone interviews. Six research assistants were recruited and made to sign a confidentiality form. The research assistants were trained to have an in-depth understanding of the research and the questionnaire as well as equipped with skills to administer a questionnaire over a period of 4 weeks.

The data was collected using Computer Assisted Personal Interviewing (CAPI) on mobile phone devices. The software used is CS Entry. This was to reduce errors with data entry. The data collected was directly stored on Dropbox in real-time. The questionnaires were evaluated with SPSS and later exported to STATA for the data analysis.

#### 3.3.2. Study variables

Opportunity evaluation is the outcome variable and the independent variables are social interaction, effectuation, and causation. The scales from various researchers compiled by Coviello and Yli-Renko (2016) were used as a guide for item development for each construct.

*Opportunity evaluation (OE):* The assessment of opportunity evaluation was done using a set of 18 questions out of which 8 had responses to be given on a 5 point-Likert scale and the remaining 10 were measured on a 100-point scale. The questions measured on a 100-point scale were later converted to a 5-point scale. The overall average of all the 18 items has used a measure of OE.

*Causation (CS):* Causation relates to opportunity identification and developing a business plan (Chandler et al., 2011). Causation takes a certain effect as given and focuses on choosing between means to create that effect. The measurement of causation was done using 7 questions measured on a 5-point Likert scale with the highest being 5 (very high extent). The overall average of all 7 items was used as a measure of Causation. Cronbach's alpha value for scale reliability and consistency was 0.69.

*Effectuation (EF):* Effectuation relates to a strategy that is evolving (Chandler et al., 2011). Effectuation is selecting between many outcomes

using a certain set of resources. This construct was assessed by 7 questions measured on a 5-point Likert scale with the highest being 5 (very high extent). The overall average of all 7 items has used a measure of effectuation. Cronbach's alpha value for scale reliability and consistency was 0.58.

*Social interaction (SI):* Social interaction refers to online social interaction where entrepreneurs connect with networks using social media tools like Facebook, Twitter, and Instagram as well as WhatsApp and LinkedIn. Social interaction was assessed using 10 questions measured on a 5 point-Likert. The scores ranged from 1-5 (1 — not at all; 2 — rarely; 3 — sometimes; 4 — almost always; 5 — always). The overall average score was estimated as the measure of SI. The scales from these researchers were used as a guide for item development for this construct (Walter, Auer, & Ritter, 2006) based on Mohr and Spekman (1994), Keller and Holland (1975). Cronbach's alpha value for scale reliability and consistency was 0.91.

### 3.4. Data analysis

The data gathered using the questionnaires were evaluated with SPSS and later exported to STATA for analysis. Descriptive statistical analysis, which included computation of means, standard deviations, and percentages, was done to determine the trend and distribution of the study variables among the study population. Exploratory factor analysis was done to ensure unidimensional scales were performed. The Cronbach's alpha coefficient was done to evaluate the internal consistency or reliability of the tools adapted for measuring opportunity evaluation, effectuation, causation, online social interaction, and social media adoption. Further, statistical analysis including Pearson correlation/Spearman rank and linear regression was carried out. The Pearson correlation/Spearman rank was to explore and quantify the relationship between causation/effectuation and opportunity evaluation while linear regression analysis assessed the impact of causation on opportunity evaluation.

## 4. RESULTS

### 4.1. Background characteristics of entrepreneurs

In total, data were collected from 383 respondents who responded to telephone interviews. Eight (8) out of every 10 selected participants (i.e., 305/383~80%) were males. The average age of all the participants was 33.83±7.03 years. More than half (i.e., 194/383~50.7%) of the respondents were first-degree graduates while about one-tenth (i.e., 40/383 or 10.4%) of them had Master's and PhD degrees. The proportion of people with no formal education was less than 1% (i.e., 3/383~0.8%). The commonest type of business engaged in by the participants was service industry and agribusiness while education and health/pharmaceuticals were above 5%. About 9 out of every 10 selected participants were on social media (i.e., 363/383 or 94.8%). Among participants on social media, almost all of them were WhatsApp users (i.e., 351/363~96.7%). Facebook was also used by most participants (i.e., 335/363~92.3%), however, Twitter users were about 3 out of every 10 (i.e., 112/363 or 30.9%).

**Table 1.** Distribution of background characteristics of entrepreneurs in Ghana

<i>Biographical data</i>	<i>Frequency</i>	<i>Per cent</i>
Age (Mean±SD)	33.83±7.03	
<i>Gender</i>		
Male	305	79.63
Female	78	20.37
<i>Education</i>		
No education	3	0.78
Primary	19	4.95
WASSCE/SSCE	49	12.79
HND/Diploma	72	18.8
Undergraduate degree	194	50.65
Master	38	9.92
DBA/PhD	2	0.52
Technical	6	1.57
<i>Type of business</i>		
Health/pharmaceuticals	11	2.87
Digital technology	39	10.18
Service industry	127	33.16
Consumer goods	31	8.09
Agribusiness	120	31.33
Education	14	3.66
Others	41	10.7
<i>Social media sign up</i>		
Yes	363	94.78
No	20	5.22
<i>Type of social media used</i>		
WhatsApp	351	96.69
Facebook	335	92.29
Instagram	169	46.56
Twitter	112	30.85

#### 4.2. Opportunity evaluation

More than 80% of respondents (323/383 or 84.3%) found the activity of searching for new ideas for products/services either very enjoyable or extremely enjoyable with less than 1% (2/383 or 0.52%) indicating it as not being an enjoyable activity. More than half of the participants (223/383 or 58.22%) were extremely motivated to improve their existing products and services while one-third (127/383 or 33.16%) of them were very motivated to do so. Almost half of the respondents (186/383 or 48.56%) indicated that the product they have now is not substantially different from what they initially imagined but a third (148/383 or 34.36%) had a substantially different product/service than what they first imagined. Four (4) out of every 10 participants (160/383 or 41.78%) had made very

major changes to their business model with some (67/383 or 17.49%) actually making extreme major changes to their business model. With regards to slight adjustments to the business model (like a price change or product design), one-third of the respondents (134/383 or 34.99%) made very major changes and about 2 out of every 10 (83/383 or 21.67%) made slight changes. There were also some that made extremely major changes in relation to minor adjustments to their business model (57/383 or 14.88%). More than half of the respondents (200/383 or 52.22%) described the process of opportunity development as increasing over the period while for some, it was described as being average (103/383 or 26.89%). Details of the participants' responses to individual opportunity evaluation questions are shown in Table 2.

**Table 2.** Responses to opportunity evaluation questions (Part 1)

<i>Opportunity evaluation</i>	<i>Mean±SD</i>	<i>Frequency</i>	<i>Per cent</i>
<i>Searching for new ideas for products/services to offer is enjoyable to me.</i>	4.31±0.83		
Not enjoyable		2	0.52
Slightly enjoyable		10	2.61
Enjoyable		48	12.53
Very enjoyable		132	34.46
Extremely enjoyable		191	49.87
<i>I am motivated to figure out how to make existing products/services better.</i>	4.48±0.69		
Slightly motivated		4	1.04
Motivated		29	7.57
Very motivated		127	33.16
Extremely motivated		223	58.22
<i>The product/service that we now provide is substantially different than we first imagined.</i>	2.78±0.48		
Not different		110	28.72
Slightly different		76	19.84
Different		49	12.79
Very different		83	21.67
Extremely different		65	16.97
<i>Have you made major changes to your business model?</i>	3.31±1.35		
Not at all		62	16.19
Slightly		53	13.84
Somewhat		41	10.7
Very major		160	41.78
Extremely major		67	17.49

**Table 2.** Responses to opportunity evaluation questions (Part 2)

<i>Opportunity evaluation</i>	<i>Mean±SD</i>	<i>Frequency</i>	<i>Per cent</i>
<i>Have you made a minor adjustment (pricing change, product design change, etc.)?</i>	3.21±1.25		
Not at all		43	11.23
Slightly		83	21.67
Somewhat		66	17.23
Major		134	34.99
Extremely major		57	14.88
<i>I would describe my idea refinement process as</i>	3.45±1.05		
Slow		41	10.7
Decreasing over time		8	2.09
Average		103	26.89
Increasing overtime		200	52.22
Radical		31	8.09
<i>I have made major changes to my business model after receiving feedback from customers or potential investors.</i>	3.46±1.25		
Not at all		47	12.95
Slightly		36	9.92
Somewhat		45	12.4
Major		174	47.93
Extremely major		61	16.8
<i>I have made a minor adjustment (pricing change, product design change, etc.), based on feedback from potential customers or investors.</i>	3.07±1.16		
Not at all		41	11.29
Slightly		80	22.04
Somewhat		79	21.76
Major		137	37.74
Extremely major		26	7.16

In assessing the level of major changes participants had made to their business model after having received feedback from customers or potential investors, more than half (235/363 or 64.73%) indicated that they had made very major/extremely major changes to their business model. In relation to minor changes, only a third (121/383 or 33.33%) indicated that they either did not make or made slight minor changes to their business model after receiving potential customer and investor feedback.

In measuring factors that influence the initial business models of participants, half of

the participants rated the influence of speaking with potential customers to be about 70%, while speaking to potential investors was rated 40%. Speaking with family and friends, using social media, and desk research were all rated at 60% by half of the participants. The factor that had the highest influence on their current business model was feedback received from customers rated at 80%, followed by social media rated at 70% by half of the participants. Family, friends and desk research ratings remained unchanged by 50% of the customers. The results are as shown in Table 3.

**Table 3.** Responses to influence on business model

<i>Responses</i>	<i>Median</i>	<i>Lower quartile</i>	<i>Upper quartile</i>
<i>A. Influence on initial business model</i>			
Speaking with potential customers	70	40	90
Speaking with potential investors	40	1	80
Speaking with friends and family	60	40	80
Social media	60	5	90
Desk research	60	30	80
<i>B. Influence on the current business model</i>			
Customer feedback	80	60	90
Investor feedback	25	1	80
Friends and family feedback	60	40	80
Social media	70	30	90
Desk research	60	30	80

Table 4a gives details of the discrimination index of the individual items which ranged from 0.48 (95% CI 0.28–0.68) to 4.18 (95% CI 2.68–5.67) with all of them being statistically significant ( $p < 0.01$ ). This shows that each item was measuring exactly what it was supposed to distinctively measure. The factors analysis had two-factor loading, Factor 1 and Factor 2. Factor 1 describes the opportunity evaluation process and the outcome being affected by some factors including social

media while Factor 2 describes factors affecting the opportunity evaluation process. Factor 1 score was between 0.5469 and 0.7384, and Factor 2 score ranged from 0.3777 to 0.6851. The factor analysis as shown in Table 4b indicates that the questions correlated with each other. The Cronbach's alpha for the reliability of the measuring tool was 0.87 that meets the minimum standard of reliability. This is shown in Table 4c.

**Table 4a.** Item discrimination index in ascending order

<i>Item</i>	<i>Discrimination index</i>	<i>95% CI</i>	<i>p-value</i>
B1	0.48	0.28-0.68	< 0.001
B2	0.63	0.39-0.87	< 0.001
B7BIII	0.65	0.4-0.89	< 0.001
B7AIII	0.70	0.48-0.93	< 0.001
B6	0.75	0.53-0.96	< 0.001
C12	0.83	0.59-1.06	< 0.001
C11	0.94	0.7-1.19	< 0.001
B5	0.95	0.69-1.21	< 0.001
B7BV	1.12	0.86-1.38	< 0.001
B4	1.15	0.87-1.42	< 0.001
B7AV	1.18	0.91-1.44	< 0.001
B7BI	1.31	1.02-1.61	< 0.001
B3	1.34	1.04-1.64	< 0.001
B7BIV	1.86	1.45-2.27	< 0.001
B7AI	2.12	1.72-2.52	< 0.001
B7AIV	2.26	1.76-2.75	< 0.001
B7AII	4.00	2.67-5.33	< 0.001
B7BII	4.18	2.68-5.67	< 0.001

**Table 4b.** Factor extraction with oblique Varimax rotated factor loadings above absolute 0.35

<i>Variable</i>	<i>Factors affecting the process of opportunity evaluation</i>	<i>The effect on opportunity evaluation</i>
B3		0.6491
B4		0.6851
B5		0.6606
B6		0.3777
B7AI	0.5634	
B7AII	0.5491	
B7AIII	0.6188	
B7AIV	0.6298	
B7AV	0.7384	
B7BI	0.5469	
B7BII	0.5909	
B7BIII	0.6559	
B7BIV	0.6372	
B7BV	0.6775	
C11		0.6267
C12		0.6449

**Table 4c.** Cronbach's alpha test of item reliability and consistency index

<i>Item</i>	<i>Sign</i>	<i>Item-test correlation</i>	<i>Item-rest correlation</i>	<i>Average inter-item covariance</i>	<i>Alpha</i>
B3	+	0.62	0.54	0.58	0.86
B4	+	0.60	0.53	0.59	0.86
B5	+	0.54	0.46	0.61	0.87
B6	+	0.41	0.33	0.63	0.87
C11	+	0.58	0.51	0.60	0.87
C12	+	0.53	0.46	0.61	0.87
B7AI	+	0.72	0.66	0.56	0.86
B7AII	+	0.77	0.71	0.54	0.85
B7AIII	+	0.49	0.40	0.61	0.87
B7AV	+	0.61	0.53	0.58	0.86
B7BI	+	0.58	0.52	0.61	0.87
B7BII	+	0.77	0.71	0.53	0.85
B7BIII	+	0.45	0.36	0.62	0.87
B7BIV	+	0.63	0.54	0.58	0.86
B7BV	+	0.60	0.52	0.59	0.87
Test scale				0.59	0.87

### 4.3. Online social interaction

In measuring participants' use of online social interaction in the development of their business opportunities, a majority (232/363 or 63.9%) indicated to have been really excited to always/almost always use it in Scanning the environment for new opportunities. Exchanging information with and learning from others online was almost always/always done among most of the participants (231/363 or 63.6%). A quarter (91/363 or 25.1%) of the participants rarely/have not successfully acquired professional information needed for their new business (e.g., research and development

information for new products or services) from online social interaction. About 30% (111/363 or 30.6%) of the participants obtain a substantial amount of their important information on customers' needs and trends from online social interaction. In making business decisions about 1 out of every 3 selected (117/363 or 32.2%) participants almost always/always rely heavily on online market information. Most of the participants (262/363 or 72.2%) felt that their online contacts were very/extremely important for their businesses. Details of participants' responses to online social interaction are shown in Table 5.



**Table 5.** Responses to influence on business model

<i>Responses</i>	<i>Mean±SD</i>	<i>Not at all</i>	<i>Rarely</i>	<i>Sometimes</i>	<i>Almost always</i>	<i>Always</i>
<i>Online social interaction</i>		<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>
Scanning the environment using social media for new opportunities really excites me.	3.68±1.18	31 (8.54)	21 (5.79)	79 (21.76)	135 (37.19)	97 (26.72)
I exchange information with and learn from others online.	3.59±1.27	43 (11.85)	26 (7.16)	63 (17.36)	136 (37.47)	95 (26.17)
I exchange ideas with others online to analyse and solve problems.	3.31±1.33	57 (15.7)	37 (10.19)	77 (21.21)	120 (33.06)	72 (19.83)
I have successfully acquired professional information needed for the new business (e.g., research and development information for new products or services) from online social interaction.	3.28±1.30	61 (16.8)	30 (8.26)	75 (20.66)	141 (38.84)	56 (15.43)
I have been capable of acquiring marketing information for the new business (e.g., market trends, competition, and sources of supplies) from online social interaction.	3.13±1.35	75 (20.66)	34 (9.37)	70 (19.28)	135 (37.19)	49 (13.5)
I get most of our valuable information on customers' needs and trends from online social interaction.	3.03±1.27	70 (19.28)	41 (11.29)	99 (27.27)	115 (31.68)	38 (10.47)
Because I interact online, we are able to obtain a tremendous amount of technical know-how online.	3.17±1.33	70 (19.28)	36 (9.92)	70 (19.28)	137 (37.74)	50 (13.77)
I rely heavily on online market information to make decisions.	2.71±1.25	96 (26.45)	47 (12.95)	103 (28.37)	100 (27.55)	17 (4.68)
I use online market information to solve specific problems.	2.77±1.27	93 (25.62)	45 (12.40)	98 (27.00)	106 (29.20)	21 (5.79)
		<i>Not at all</i>	<i>Slightly important</i>	<i>Somewhat important</i>	<i>Very important</i>	<i>Extremely important</i>
		<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>
My online contacts are very important for my work.	3.85±1.27	31 (8.54)	34 (9.37)	36 (9.92)	120 (33.06)	142 (39.12)

#### 4.4. Causation

In assessing the way of thinking of the participants that serves them in their process of venture creation, specifically causation, 3 out of 4 (290/383 or 75.6%) analysed long-run opportunities and selected what they thought would provide the best returns to a high extent/very high extent. More than half to a high extent/very high extent (318/383 or 82.9%) designed and planned business strategies. Nine (9) out of 10 (349/383 or 91%) to a high extent/very

high extent had a clear and consistent vision of where they wanted to be. Four (4) out of 10 participants (154/383 or 40.2%) integrated surprising results and findings to a high extent when the original project target was at risk. More than 50% (243/383 or 63.5%) to a high extent/very high extent carried out project planning basically at the beginning. Almost 9 out of 10 participants (344/383 or 89.8%) always paid attention to the original project target to a high extent/very high extent. The details are as in Table 6.

**Table 6.** Responses to causation

<i>Responses</i>	<i>Mean±SD</i>	<i>Not at all</i>	<i>Little extent</i>	<i>Somewhat</i>	<i>High extent</i>	<i>Very high extent</i>
<i>Causation</i>		<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>	<i>n (%)</i>
I analysed long-run opportunities and selected what I thought would provide the best returns.	3.92±0.88	6 (1.57)	21 (5.48)	66 (17.23)	194 (50.65)	96 (25.07)
I designed and planned business strategies.	4.05±0.91	9 (2.35)	19 (4.96)	37 (9.66)	196 (51.17)	122 (31.85)
I had a clear and consistent vision for where I wanted to end up.	4.31±0.78	4 (1.04)	10 (2.61)	20 (5.22)	179 (46.74)	170 (44.39)
I only integrated surprising results and findings when the original project target was at risk.	3.07±1.12	47 (12.27)	68 (17.75)	96 (25.07)	154 (40.21)	18 (4.7)
My R&D process focused on reaching the project target without any delay.	3.61±1.13	31 (8.09)	36 (9.4)	53 (13.84)	195 (50.91)	68 (17.75)
The project planning was basically carried out at the beginning of the project.	3.50±1.16	33 (8.62)	48 (12.53)	59 (15.4)	179 (46.74)	64 (16.71)
I have always paid attention to reach the original project target.	4.17±0.71	3 (0.78)	8 (2.09)	28 (7.31)	225 (58.75)	119 (31.07)

The exploratory factor analysis and Cronbach's alpha analysis were conducted to assess how well the questions correlated with each other and the reliability of the data collection tool. The results in Table 7a revealed a discrimination index between 0.65 (95% CI 0.32-0.97) and 2.42 (95% CI 1.72-3.12) which shows that each item was measuring exactly what it was supposed to measure and were

significantly (p-value 0.001 < 0.01) distinct. Further, with a factor score between 0.0462 and 0.6767, the factor analysis as shown in Table 7b indicates that the questions correlated with each other. The Cronbach's alpha for the reliability of the measuring tool was 0.70, which meets the minimum standard of reliability. This is shown in Table 7c.

**Table 7a.** Item discrimination index in ascending order

Item	Discrimination index	95% CI	p-value
E6	0.65	0.32-0.97	< 0.001
E1	1.22	0.84-1.6	< 0.001
E5	1.24	0.88-1.6	< 0.001
E7	1.51	1.06-1.96	< 0.001
E3	1.79	1.27-2.31	< 0.001
E2	2.42	1.72-3.12	< 0.001

**Table 7b.** Factor extraction with oblique Varimax rotated factor loadings from absolute 0.40 and above

Variable	Factor 1
E1	0.462
E2	0.6767
E3	0.5901
E5	0.4969
E7	0.5089

**Table 7c.** 24 Cronbach's alpha test of item reliability and consistency index

Item	Obs.	Sign	Item-test correlation	Item-rest correlation	Average inter-item covariance	Alpha
E1	383	+	0.61	0.36	0.27	0.67
E2	383	+	0.76	0.57	0.20	0.57
E3	383	+	0.67	0.49	0.24	0.62
E5	383	+	0.70	0.40	0.23	0.67
E7	383	+	0.61	0.43	0.27	0.65
Test scale					0.24	0.69

#### 4.5. Effectuation

In assessing the way participants think that effectuation serves them in their process of venture creation, more than half (255/383 or 66.5%) tested varied products and business models on what they thought would offer the best returns to a high extent/very high extent. Eight (8) out of 10 (224/383 or 84.3%) adapted their resources to what they had to a high extent/very high extent. To a high extent/very high extent, almost 9 out of 10 (337 or

88%) were open-minded, taking advantage of available opportunities. Planning and implementation were done gradually by 76.5% (293/383) participants to a high extent/very high extent. To a high extent/very high extent, more than half of the participants (256/383 or 66.8%), allowed the project to develop as opportunities arose although the opportunities have not been in line with the original project. Table 8 provides a summary of the detailed results.

**Table 8.** Responses to effectuation

Responses	Mean±SD	Not at all n (%)	Little extent n (%)	Somewhat n (%)	High extent n (%)	Very high extent n (%)
<b>Effectuation</b>						
I experimented with different products and/or business models that I thought would provide the best returns.	3.49±1.31	58 (15.14)	30 (7.83)	40 (10.44)	178 (46.48)	77 (20.1)
I adapted what I was doing to the resources we had.	4.03±0.75	4 (1.04)	11 (2.87)	45 (11.75)	234 (61.1)	89 (23.24)
I was flexible and took advantage of opportunities as they arose.	4.14±0.80	5 (1.31)	14 (3.66)	27 (7.05)	212 (55.35)	125 (32.64)
I avoided courses of action that restricted my flexibility and adaptability.	3.90±0.90	8 (2.09)	23 (6.01)	59 (15.4)	201 (52.48)	92 (24.02)
I always tried to integrate surprising results and findings during the R&D process even though this was not necessarily in line with the original project target.	3.25±1.14	38 (9.92)	59 (15.4)	96 (25.07)	151 (39.43)	39 (10.18)
The project planning was carried out in small steps during the project implementation.	3.87±1.06	21 (5.48)	23 (6.01)	46 (12.01)	187 (48.83)	106 (27.68)
I allowed the project to evolve as opportunities emerged even though the opportunities have not been in line with the original project.	3.67±1.02	19 (4.96)	30 (7.83)	78 (20.37)	188 (49.09)	68 (17.75)

The exploratory factor analysis and Cronbach's alpha analysis were conducted to assess how well the questions correlated with each other and the reliability of the data collection tool. The results in Table 9a revealed a discrimination index between 0.76 (95% CI 0.42-1.11) and 1.48 (95% CI 0.85-2.11) which shows that each item was measuring exactly what it was supposed to measure and were significantly (p-value 0.001 < 0.01) distinct. Further,

with a factor score between 0.40 and 0.50, the factor analysis as shown in Table 9b indicates that the questions correlated with each other. The Cronbach's alpha for the reliability of the measuring tool was 0.60 (shown in Table 9c) which falls below the minimum standard of reliability. However, a correlation analysis (shown in Table 10) shows that effectuation as a variable correlated well with other variables.

**Table 9a.** Item discrimination index in ascending order

	<i>Discrimination index</i>	<i>95% CI</i>	<i>p-value</i>
F5: I always tried to integrate surprising results and findings during the R&D process even though this was not necessarily in line with the original project target.	0.76	0.42-1.11	< 0.001
F1: I experimented with different products and/or business models what I thought would provide the best returns.	0.80	0.46-1.13	< 0.001
F6: The project planning was carried out in small steps during the project implementation.	1.02	0.59-1.46	< 0.001
F4: I avoided courses of action that restricted my flexibility and adaptability.	1.10	0.55-1.64	< 0.001
F7: I allowed the project to evolve as opportunities emerged — even though the opportunities have not been in line with the original project.	1.14	0.65-1.63	< 0.001
F2: I adapted what I was doing to the resources we had.	1.26	0.86-1.67	< 0.001
F3: I was flexible and took advantage of opportunities as they arose.	1.48	0.85-2.11	< 0.001

**Table 9b.** Factor extraction with oblique Varimax rotated factor loadings above absolute 0.35

<i>Variable</i>	<i>Factor 1</i>
F2	0.40
F3	0.50
F4	0.49
F5	0.41
F6	0.37
F7	0.44

**Table 9c.** Cronbach's alpha test of item reliability and consistency index

<i>Item</i>	<i>Obs.</i>	<i>Sign</i>	<i>Correlation</i>	<i>Correlation</i>	<i>Covariance</i>	<i>Alpha</i>
F2	383	+	0.51	0.31	0.19	0.55
F3	383	+	0.55	0.34	0.18	0.53
F4	383	+	0.55	0.31	0.18	0.54
F5	383	+	0.62	0.33	0.16	0.54
F6	383	+	0.58	0.30	0.17	0.55
F7	383	+	0.62	0.36	0.16	0.52
Test scale					0.17	0.58

Table 10 provides details of the mean score of the opportunity evaluation process and outcome and the correlation values between them. All three constructs had a significantly positive relationship.

Averagely, the study participants rated OE 3.07±0.89. Significantly, it correlated positively with SI, CS, and EF.

**Table 10.** Mean score of variables and their Pearson product-moment correlation coefficient

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>OE</i>	<i>SI</i>	<i>CS</i>	<i>EF</i>
<i>OE</i>	3.07	0.89	1			
<i>SI</i>	3.25	0.90	0.61* (<0.001)	1		
<i>CS</i>	4.01	0.59	0.1851* (<0.001)	0.27* (<0.001)	1	
<i>EF</i>	3.81	0.54	0.20* (<0.001)	0.27* (<0.001)	0.47* (<0.001)	1

Note: \* statistically significant at 0.01.

The regression model is used to assess if the effect of online social interaction on OE depends on effectuation and causation, and their moderation effect:

$$OE = b_0 + b_1 * SI + b_2 * EF + b_3 * CS + b_4 * (SI * EF) + b_5(SI * CS) \quad (2)$$

where,  $b_0$  = intercept;  $b_1, b_2, \dots, b_5$  are the regression coefficients associated respectively with the predictor variables. The linear regression model showed that although there is a positive relationship between effectuation and SI while causation interacts negatively with SI, the moderation effects were not statistically significant ( $p > 0.05$ ) for both situations where covariates (competition, technology) are controlled for and where they are

not controlled for. This is shown in Table 11. However, F-statistics of 43.96 and  $R^2$  value of 0.3811 were obtained for the model, where the covariates were not controlled while F-statistics of 31.75 and  $R^2$  value of 0.4146 were obtained for the model when the covariates were controlled for. These values were statistically significant ( $p < 0.01$ ) implying the models were both statistically significant and therefore fit for making predictions. Thus, the  $R^2$  values indicate that 38.11% of the difference in the dependent variable is explained by the social interaction, effectuation, causation, and the covariates while in the controlled for model, 41.78% of the difference in the dependent variable (opportunity evaluation) is explained by the social interaction, effectuation, causation, and their interaction.

**Table 11.** Effect of online social interaction on entrepreneur's opportunity evaluation using effectuation and causation as moderators

	Without controls		With controls <sup>a</sup>	
	$\beta$ (95% CI)	p-value	$\beta$ (95% CI)	p-value
SI	1.21 (0.67-1.75)	< 0.001*	1.13 (0.6-1.66)	< 0.001*
EF	0.2 (-0.28-0.68)	0.411	0.13 (-0.34-0.6)	0.587
CS	0.39 (-0.05-0.84)	0.084	0.42 (-0.01-0.86)	0.057
c.SI#c.EF	-0.05(-0.2-0.1)	0.533	-0.03 (-0.18-0.11)	0.654
c.SI#c.CS	-0.12 (-0.27-0.02)	0.09	-0.14 (-0.28-0)	0.056
Number of obs.	363		363	
F (5, 357)	43.96		31.75	
Prob > F	< 0.001*		< 0.001*	
R-squared	38.11%		41.78%	
Adj R-squared	37.24%		40.46%	
Root MSE	0.67		0.66	

Notes: <sup>a</sup> Other variables controlled for were: competition, technology, offline social interaction.

\* statistically significant at 0.01.

## 5. DISCUSSION OF RESULTS

Effectuation and causation show us the path entrepreneurs chart when planning to launch new ventures. The theory of effectuation provides two processes through which entrepreneurs establish business and these are causation and effectuation (Sarasvathy, 2001). Effectuation is more likely to occur in uncertain environments while causation processes would most probably be used in predictable environments (Fischer & Reuber, 2011). Causation processes are effect-dependent meaning that the entrepreneur's choice of effect is subject to the knowledge he has of the possible means available (Sarasvathy, 2001). The knowledge of possible means can be obtained via online social interaction. On the other hand, effectuation processes are actor-dependent meaning that the choice of means depends on the entrepreneur's knowledge of possible means (Sarasvathy, 2001). This knowledge can also be obtained via social media. Uncertainty would require more information to enable decision-making and hence it was expected that online social interaction would be higher for effectuation. This was confirmed by the empirical results though was not statistically significant. This is in line with the study of Fischer and Reuber (2011). The study revealed that it does not matter whether an entrepreneur uses causation or effectuation; the amount of online social interaction is not affected by it.

It must, however, be noted that most entrepreneurs use both processes with effectuation usually dominating early business development (Reymen, Berends, Oudehand, & Stultiens, 2017). The simultaneous use of both processes could also explain the reason for the results. The study also adds to the findings of Fischer and Reuber (2011) and Park, Sung, and Im (2017) by offering more detailed insight into the use of social media/online social interaction.

## 6. CONCLUSION

Using a quantitative method approach, this study sought to examine if the effect of online social interaction on opportunity evaluation depends on effectuation and causation.

The main trigger for the use of effectuation is the lack of resources (Malsch & Guieu, 2019) and effectuation has been shown to help create networks

which in turn provides the entrepreneur access to resources that are lacking (Malsch & Guieu, 2019). In evaluating opportunities, therefore, networks play an important role. It has also been found that entrepreneurs use both approaches simultaneously but not necessarily exclusive and the use of the approach depends on what the entrepreneur's networks use (Kerr & Coviello, 2020). We, therefore, contribute to the theory of causation and effectuation and network theory by showing that online social interaction via social media does not depend on which decision logic an entrepreneur is using and confirms that both logics can be used by an entrepreneur.

In practice, there is to a large extent a scarcity of resources for nascent entrepreneurs, especially in Sub-Saharan Africa, hence making the evaluation of opportunities difficult and this also creates the inability to make the right decision whether the causation approach is being used or the effectuation approach. To help improve the opportunity evaluation process, entrepreneurs would need to be directed to where resources are available and online social interaction is a source of resources. The study thus helped to show that no matter the decision process an entrepreneur uses, online social interaction can be used to obtain the needed resources.

The research is however not without limitations. The data were collected in Sub-Saharan Africa and may produce results that peculiar to the region and hence the study should be replicated in other regions to see if the same results would be obtained. Since this is a quantitative study, the details of when and why effectuation or causation is used are not known. The study was also a cross-sectional study but a longitudinal study would have revealed when online social interaction occurs more during the entrepreneurial journey and when causation or effectuation is used more prominently.

Identifying the factors that affect opportunity evaluation or affect online social interaction during opportunity evaluation and to what extent they do, will help target the factors that positively enhance the opportunity evaluation process, which should guide entrepreneurial training. Therefore, it is recommended that future research also understands other factors that may facilitate or hinder the opportunity evaluation process.

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