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**DOES TECHNOPRENEURS' ENTREPRENEURIAL
ORIENTATION MATTER ON START-UP SUCCESS? THE ROLE
OF GENDER**

Daisy Mui Hung Kee (a)*, Nurulhasanah Abdul Rahman (b)
*Corresponding author

(a) School of Management, Universiti Sains Malaysia, Penang, Malaysia, daisy@usm.my

(b) School of Management, Universiti Sains Malaysia, Penang, Malaysia, hasanah.rahman89@yahoo.com

Abstract

This paper examines the influence of technopreneurs' entrepreneurial orientation (EO) on start-up success with a specific focus on the role of gender. Research examining the association between technopreneurs' EO and start-up suggests that there is a gap on how gender may affect EO on start-up success especially in Malaysia, an emerging economy in the region. Given the nature of the research, a quantitative approach is employed. A total of 79 spin-off and symbiosis companies were chosen, and PLS-SEM was employed to examine the relationships among the constructs. The statistical results showed that EO is associated with start-up success. Further, this paper presents the importance role of gender among spin-off and symbiosis company owners to engage in EO. Results suggests that the men technopreneurs exhibited different entrepreneurial behaviors or EO dimension in managing their business successfully comparing with their female counterparts. Consequently, the start-up success can be enhanced as the spin-off and symbiosis company owners are aware of the potentials of EO in securing positive outcomes. These findings show that the role of gender may affect how the owners/managers view in their business in terms of entrepreneurial-related practices which may have an impact on the start-up success.

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Keywords: Entrepreneurial Orientation, Start-up, Start-up Success, Gender, Spin-off and Symbiosis Company, Malaysia.



1. Introduction

There is a plethora of research has been dedicated to the topics of Entrepreneurship and gender studies (Lim & Envick, 2013; Marlow & McAdam, 2013; Basyith, Idris, & Fitriya, 2014). The gender differences among entrepreneurs are in terms of entrepreneurial intentions, technology-innovation adoption, social engagement, and so forth (Ayub, Razzaq, Aslam, & Iftekhhar, 2013; Goktan & Gupta, 2015). Over the past decades, the of research on EO has recently focus on the gender perspectives. Fellnhofer, Puumalainen, and Sjogren (2016) reported that females tend to perceive their EO practices as lower than the males, but the perceptions of work performance are identical across genders. Kelley, Singer and Herrington (2016) also viewed that females entrepreneurs, comparing with male entrepreneurs were less engaged in entrepreneurial activities. They suggested that the perceptions of male and female entrepreneurs might differ in entrepreneurial activities due to the different context such as cultures, countries and certain entrepreneurial stages. Given that much more research is needed to explore the gender differences in entrepreneurial activities, this paper intends to examine the role of gender on entrepreneurial-related behavior and start-up success among start-up, particularly in Malaysia context, an emerging market with a multicultural background. The existence of multiple ethnic groups in Malaysia is obviously a complex social phenomenon that offers both challenges and opportunity for a country and its people.

In addition, this paper focuses on spin-off and symbiosis company. To date, there has been little research that focus on spin-off and symbiosis company. Spin-off and symbiosis company are new ventures, without adequate knowledge and funds. Bocken (2015) defined spin-off and symbiosis company as a firm at the infantile stage and relies on other firm's skills, resources, and business strategies to survive. In general, spin-off and symbiosis company have one of the following characteristics: (a) a firm which includes a public sector or university employee as a founder; (b) a firm which licenses technology from a university or public research institution, and (c) a firm in which a university or national laboratory has taken up equity investment company. The intellectual property of the university is formally transferred to the start-up firms (Lockett et al., 2005). Spin-off and symbiosis company was introduced in Malaysia since 2011 under the Ninth Malaysia Plan as a research collaborative effort between university and industry. The research on spin-off and symbiosis company are an emerging research topic, and hence, warrants for more research to be done in culturally diverse Malaysia.

Previous literature had witnessed that EO is one important determinant of firm performance, firm survival, and firm success. This paper extends the scope of study to start-up as most of the related empirical studies focuses more on SMEs or firms in general. Start-up are fragile as approximately half of them can hardly survive in the first five years of operation. This paper argues that EO is predictive of the success of start-up because entrepreneurial skills and knowledge are the cornerstone to a start-up. To survive and to be successful, start-up should gain a competitive advantage over their competitors to increase their survival rate. The paper suggests that EO benefits the survival of start-up by shaping the owners/managers' thoughts, behavior, and ideas. EO is seen as the entrepreneurial strategic posture at the firm level to contribute better entrepreneurial decisions and actions (Rauch, Wiklund, Lumpkin, & Frese, 2009; Fellnhofer et al., 2016). EO refers to the firm processes, structures, and behaviors which is conceptualized into innovativeness, proactiveness, and risk-taking (Miller, 1983; Covin & Slevin, 1989). EO is also viewed

as the strategy-making processes and an approach on how particular business affects entrepreneurial activities (Lumpkin & Dess, 2001).

EO is treated as a multi-dimensional construct, and each dimension may have a different association with the performance variables (Lumpkin & Dess, 1996; Naldi, Nordqvist, Sjoberg, & Wiklund, 2007; Zeebaree & Siron, 2017). For instance, innovativeness and proactiveness may have a positive association with higher performance while risk-taking may have a different effect. Following this notion, this paper provides key insights into how EO affects the start-up success.

2. Problem Statement

In recent years, the phenomenon of entrepreneurship has attracted the interest of researchers and policy makers that recognized its positive effect on economic development. Commensurate with entrepreneurship, EO is a multi-dimensional concept that involves three key components namely innovativeness, proactiveness, and risk-taking. This paper argues that EO is one critical component that is needed to increase the reliability and consistency in the business direction of start-up. The recent exponential growth of entrepreneurship and start-up contribute substantially to the economic development of Malaysia. Given the economic importance of start-up in Malaysia and its nature for being quite fragile, government and policy makers are increasing turning their attention towards initiatives intended to foster and protect start-up. Start-up are firms with an elevated risk and uncertainty (Durda & Krajcik, 2016).

According to Ghosh and Bhowmick (2014), uncertainty in entrepreneurship relates to the context of decision-making. They also observed that the relative importance of the EO concept for the start-up's future growth and survival. Previous studies considering that a high level of EO practices increases superior performance (Naldi et al., 2007; Zeebaree & Siron, 2017), improves business growth (Johansen, 2013; Amin, Ramayah, Aldakhil, & Kaswuri, 2016) and increases survival rates (Shehu & Mahmood, 2015; Adamako, Narteh, Danquah, & Analoui, 2016). Despite these findings, there are still many themes that remain relatively unexplored especially in understanding EO on start-up. Scholars (e.g., Janakova, 2015) highlight the predictors of the success of start-up or new venture business are closely linked to the efforts or actions keeping a firm to be financially stable and resilient in the first five years of operation. Despite the extensive review on EO and firm performance relationship, the literature on gender impact on EO practices is less generous and inadequate (Fellnhofner et al., 2016; Priya & Sreeranganadhan, 2017). In this sense, it is important to understand the influence of gender on the EO and start-up success. For instance, recent empirical findings indicated that female entrepreneurs' involvement in Malaysia is much higher than male entrepreneurs (Ong, Habidin, Salleh & Fuzi, 2016). According to Vossenbergh (2013) and Musa, Shuib, Selamat, Isa, Osman, and Bakar (2016), a high number of female entrepreneurs reflects a more dynamic workforce in entrepreneurship. In the past, the business is largely dominated by male entrepreneurs, especially in electronics, hardware, and technology (SMECorp Malaysia, 2015). Nowadays, as the globalization era is expanding, many start-ups are owned by female entrepreneurs (Ong et al., 2016). Researchers also observed that female entrepreneurs mostly dominate the online businesses which require some form of technical competence (for example, the use of technology) (Hoe, Isa, Hin, Hashim, Yunus, and Abdullah, 2012; Surin, Halil & Edward, 2015). Researchers such as Bertoneclj and Kovac (2009), Fellnhofner et al. (2016) and Kelley et al. (2016) found that female entrepreneurs tend to engage in EO

practices comparing with male entrepreneurs. On the contrary, Goktan and Gupta (2013) found that male entrepreneurs tend to practice higher EO and achieve superior performance. Given that much more research is needed to explore the gender differences in entrepreneurial activities, this paper intends to examine the role of gender on EO and start-up success.

3. Research Questions

The primary purpose of the paper is to examine the impact of EO (innovativeness, proactiveness and risk-taking) on start-up success and on which dimension is more important to start-up success. In addition, the paper investigates the role of gender on the mentioned relationship. It aims to answer the following questions:

- a) Does innovativeness have a relationship with start-up success?
- b) Does proactiveness have a relationship with start-up success?
- c) Does risk-taking have a relationship with start-up success?
- d) Does male's EO have a stronger relationship with start-up success?

4. Purpose of the Study

With reference to the above discussion, the paper examines the relationship between EO and start-up success among the spin-off and symbiosis company owners/managers. The paper argues that the gender perspectives of owners of spin-off and symbiosis company could serve as lenses through which owners/managers subjectively view their entrepreneurial orientation and decide on appropriate responses that help them to succeed in their start-up. The paper theorizes and empirically test this relationship for a dynamic industry context. With this, the goal of this paper is three-fold: (a) to examine the relationship between the entrepreneurial orientation (innovativeness, proactiveness and risk-taking) among owners/managers of spin-off and symbiosis company in Malaysia; (b) to gain a better understanding of the gender perspectives among the constructs of interest in order to bring out the best in owners/managers' performance and sense of success; and (c) to draw conclusions on the possible implications of the relationships established through this research specifically for the spin-off and symbiosis company in Malaysia.

5. Research Methods

The research is conducted within Malaysian spin-off and symbiosis company. Four factors guided the choice of the spin-off and symbiosis company. First, this industry is gaining increasing importance in both the academic and practitioner literature in Entrepreneurship. Second, spin-off and symbiosis company are a collaborative effort between the university and industry players. Third, spin-off and symbiosis company are founded by technopreneurs. 57% of the technopreneurs in the sample are the spin-off and symbiosis company owners and founded their companies. Because of the small size of operations and the dual roles of technopreneurs as both owners and managers, technopreneurs in spin-off and symbiosis company has more power in strategy formulation and involve in the decision making. Fourth, this is the first empirical research that investigates the start-up success among spin-off and symbiosis company.

Young SMEs such as spin-off and symbiosis company is well-suited to examination of the proposed relationships.

A sample of 120 spin-off and symbiosis company expressed interest and agreed to participate in the study. The data were collected over three months. After the data screening had been carried out, only 79 surveys were found useful and this contributes to 65.83% of response rate.

The dependent variable of the study is start-up success. To measure the self-perceptions of owners/managers' start-up success, 18 items from Zhou and Wit (2009) was employed. The 15-item measuring EO was adapted from Fellnhofer et al. (2016). The owners/managers were asked to respond to the statements on a seven-point Likert-type scale anchored at one end by "Strongly disagree" (1) and the other end by "Strongly agree" (7). Minor changes have been made by the researchers to fit with Malaysian context. A total of ten owner were randomly chosen as the respondents for the pre-test. A pre-test was carried out to ensure the respondents understand and interpret the items in the questionnaires as intended.

More than half of the respondents are female (57%). The present study reflects the similar scenario as reported by Ong et al (2016) who observed that female entrepreneurs dominates the start-up. 58% of the respondents are the owners and the remaining are managers (42%). Among the 79 respondents, 40% are degree/professional qualification holders. The majority of the respondents (57%) stated that they have less than five full-time employees and the rest employed less than 30 employees.

6. Findings

The research model depicted in path model was developed using SmartPLS 3.2.6. In the model, all the statements in the questionnaire are referred to as indicators or items. The indicators with factor loadings below 0.5, which contribute to low average variance extracted (AVE) were deleted from the model (Hair et al., 2014). As such, two indicators (EO3 and SP4) were deleted. To decide whether those indicators were to be removed, the researchers took the advice from Hair et al (2014) who emphasize to consider if the removal leads to the increase in the composite reliability (CR) or average variance extracted (AVE) and, if the removal affects content validity. Careful decisions were made when removing the above-mentioned indicators or items which have low factor loadings. After the removal of the indicators, the AVE of all constructs had exceeded the cut-off value of 0.5 (See Table 1).

Table 01. Convergent Validity Assessment

Construct	CR ^a	AVE ^b	Convergent Validity (AVE > 0.5)
Start-up success	0.916	0.504	YES
Entrepreneurial orientation	0.948	0.573	YES
Innovativeness	0.904	0.703	YES
Proactiveness	0.895	0.641	YES
Risk-taking	0.931	0.734	YES

*Note: ^aComposite reliability (CR); ^b Average variance extracted (AVE)

As shown in Table 2 below, the results of discriminant validity using Fornell and Larcker criterion demonstrate the discriminant quality of the model. Apparently, there is no issue of multi-collinearity as the square root of AVE for each construct is greater than each correlation coefficient obtained (Hair et al., 2010; Hair et al., 2014; Bagozzi & Yi, 1988).

Table 02. Discriminant Validity

	SS	EO	I	P	RT
Start-up success (SS)	0.819				
Entrepreneurial orientation (EO)	0.710	0.957			
Innovativeness (I)	0.739	0.839	0.844		
Proactiveness (P)	0.752	0.757	0.744	0.858	
Risk taking (RT)	0.735	0.921	0.610	0.800	0.857

*Note: Values in diagonal and bold represent the square root of AVE while those of off diagonal values represent the simple bivariate correlations between the constructs.

The result of the structural model is presented at Table 3. Bootstrapping was employed to determine if the hypothesized path relationships among the constructs under study are significant. In this study, bootstrapped 5000 sub-samples were created to obtain approximate t-values for significance testing of the structural paths. The results showed that all the hypothesized relationships were found significant. RT -> SS was significant at 95 percent confidence interval ($p < 0.05$) with t value recorded at 2.063 while I -> SS and P -> SS were significant at 99 percent confidence interval ($p < 0.01$) with t values recorded at 4.355 and 2.930 respectively. This indicates that the proposed direct relationships between the constructs under study are supported. R² value of 0.671 suggests that EO explain 67.1% of the variance in start-up success. The findings of the effect size assessment reveal that both the proactiveness (0.0161) and risk taking (0.0161) have small effect size on start-up success while innovativeness (0.1820) have medium effect size on start-up success. Hence, innovativeness shows a larger effect size on start-up success than that of proactiveness and risk taking. These findings illustrate that innovativeness plays a heavier role in explaining start-up success.

Table 03. Structural Model

	Path Coefficient	R ²	t-value	Effect Size f ²	Predictive Relevance Q ²
EO->SS	0.819	0.671	5.497**		0.353
I->SS	0.321		4.355**	0.1820	
P->SS	0.366		2.930**	0.0161	
RT->SS	0.411		2.063*	0.0161	
EO ->SS (Male)	0.874	0.764	4.124**		0.300
EO ->SS (Female)	0.807	0.652	3.332**		0.287

*Note: **significant at $p < 0.01$; * significant at $p < 0.05$

Table 04. Does Male Entrepreneurs' EO Have a Stronger Relationship with Start-up success?

Path Relationship	t-value		Result	Higher Results
EO → SS	4.716**		Significant	Yes
I → SS	9.051**		Significant	Yes
P → SS	4.191**		Significant	Yes
RT → SS	3.353**		Significant	No

*Note: **significant at $p < 0.01$; * significant at $p < 0.05$

Table 4 demonstrates the results of PLS multi-group analysis between male and female sub-samples (Sarstedt, Henseler, & Ringle, 2011). One of the key findings in the present study is that the role of gender

has an impact on EO and start-up success. As compared to female entrepreneurs, male entrepreneurs' EO explained a higher variance of start-up success, particularly with the innovativeness and proactiveness dimensions. However, it is interesting to note that female entrepreneurs' risk taking explained a higher variance of start-up success as compared to their male counterparts. It could be possibly that women entrepreneurs feel more confident in making risk-related business decision. This interesting finding paints a positive picture of women business owners in risk-taking incentives.

7. Conclusion

This study focused on start-up firms which exclusively on the spin-off and symbiosis companies because the support needed is limited as compared to the other business entities in a stable market. The main objective of this study is achieved. Although start-up success construct is studied across countries due to its importance to business organizations, little is known about the relationship between EO of technopreneurs owners/managers and start-up success. There are two major findings generated from this research. First, EO of technopreneurs owners/managers was confirmed as a good predictor to start-up success in the Malaysian spin-off and symbiosis companies. This paper validates and supports the past research (Brockman, Jones & Becherer, 2012; Boso, Story & Cadogan, 2013) that EO is a key component for the success of small medium-sized enterprises. This paper also highlights that innovativeness is a stronger predictor than that of proactiveness and risk taking to create effect on start-up success.

Second, this paper provides an evidence that gender influences technopreneurs' individual EO. Individual EO is higher among men business owner rather than their women counterparts. Compared to women, men business owners exhibited different entrepreneurial behaviors or EO dimension in managing their business successfully. Men business owners were more innovative and proactive while their women counterparts were more risk taking in entrepreneurship development. The universal perception that 'women are more risk averse than men entrepreneurs' merits reconsideration. This interesting finding paints a positive picture of women business owners in risk-taking approach.

The findings of this paper have shed lights on the spin-off and symbiosis companies in Malaysia which will most likely complement the EO of business owners to raise their start-up success. In addition, being aware of the gender differences in EO as documented in the gender literatures, and how this impact on the start-up success is an interesting attempt. This is useful and practical for the start-up business owners as well as the managers in their efforts in managing their business. [

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