
Lean start-up awareness and effect on entrepreneurial intentions among Malaysian youths

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Abstract: In an attempt to develop greater interest in enterprise start-up, this study examines the level of awareness of lean start-up model and its effect on entrepreneurial intentions among Malaysian youths. In this study, we argue that greater entrepreneurial interest could be ignited in the youths if lean start-up model is applied in teaching and learning. Using a survey, data were collected from 191 university students at three universities in Malaysia peninsula. These data were analysed with descriptive statistics and regression methods. We found that majority of the students were not aware of lean start-up model. Our research also established a significant positive effect of lean start-up on entrepreneurial intentions among Malaysian youths. We recommend that the government and university authorities should draft appropriate strategies (e.g. inclusion in syllabus) that will engender greater awareness and adoption of lean start-up, especially among students and lecturers, for enterprise creation in the country.

Keywords: lean start-up; entrepreneurial intentions; university youths; Malaysia; management in education.

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1 Introduction

It is worrisome to discover that most Malaysian graduates who had received entrepreneurial education from universities do not mature their entrepreneurial intentions into business formation. The work of Abdullah et al. (2009) which found lack of industrial exposure, trainee characteristics and training environment to be the reason, testified to this discovery. In further support of this; Mayer et al. (2007) found that poor perception about entrepreneurship from social networks was the major reason for low business venturing among youth graduates; yet entrepreneurial education was found to correlate positively with entrepreneurial intentions and self-employment (Gatewood et al., 2004; Ekpe and Mat, 2012; Stohmeyer, 2007). Therefore, further research was necessary, otherwise the introduction of entrepreneurial courses into the educational curriculum would be a waste of resources. Also, sourcing first-hand information from the students was another way of discovering the reason for low entrepreneurial intentions among graduates.

Developing entrepreneurial intentions among Malaysian youths will develop positive mindsets in them towards creativity, innovation and invention. This will, ultimately, lead to an increase in the rate of self-employment, employment generation and new business formation (Ekpe, 2011). It will also lead to improvement in the nation's Gross Domestic Product through the establishment of micro, small and medium scale enterprises (MSMEs). However, the establishment of new enterprises by these youths needs support from various stakeholders in the economy. Aside private corporate bodies and non-governmental organisations, the government of a nation (Malaysia inclusive) also offers

greater support to enterprise start-up and development; yet current efforts aimed at assisting entrepreneurs are insufficient. Many enterprise-assisted schemes or micro-finance models have been developed in the past which have proven to be helpful but these are not without a demerit. Therefore, researches continue to create easier and efficient enterprise development programs in the world; among which is lean start-up.

Lean start-up model has wide application by universities offering entrepreneurship courses in many developed countries, as most educators currently adopt lean start-up and customer development methods in teaching and learning (York and Danes, 2014). This study aims to examine the level of awareness and adoption of lean start-up model and its effect on entrepreneurial intentions among university youths in Malaysia. The ultimate result is to develop greater interest in enterprise start-up and management among youths in particular, and adults in general. This is so because knowledge and application of lean start-up could lead to intention to create a venture (Mollick, 2014; Ries, 2011; Zijdemans and Tanes, 2014). If the educators are oblivious of this novel enterprise model, it could lead to shirk of duty and sham of expertise and its adoption for entrepreneurial intentions among the youths may just be a dream. Therefore, this study intends to find answers to the following questions: are entrepreneurial students and teachers in Malaysia aware of lean start-up model? What effect would application of lean start-up have on youths' entrepreneurial intentions in Malaysia?

Global studies abound on entrepreneurial education and intentions (e.g. Stohmeyer, 2007; Ying, 2008), yet there is scarcity of studies that measure lean start-up awareness and effect on entrepreneurial intentions, especially in Malaysia. Also, most of the previous studies on lean start-up used literature review approach to draw conclusions (e.g. Erkinheimo et al., 2015; Nirwan and Dhewanto, 2015; Zijdemans and Tanev, 2014). Again, studies have concluded that work environment or organisational climate such as task characteristics, work processes and infrastructure have profound influence on employee's behavioural intentions (Akintayo, 2012; Baeza et al., 2009; Chukwunye and Igboke, 2011; Ekpe et al., 2017; Srivastava, 2008) yet no known study has measured its effect on youth's entrepreneurial intentions. This study intends to fill this gap by empirically measuring the effect of lean start-up on entrepreneurial intentions among Malaysian youths, using a quantitative research (questionnaire) and regression analysis methods to collect and analyse data as well as draw valid conclusions.

2 Literature review

2.1 Lean start-up: theoretical foundation

To avoid enterprise's low survival rate and business failure (Harrison and Mason, 2007), lean start-up could be the best option. Ries (2011) suggested that entrepreneurs should concentrate in continuous development of new products and services, through innovation, to meet the needs of early customers in order to reduce failure risk. Similar to lean manufacturing and lean management, lean start-up model seeks to eliminate wasteful practices in trying to create better customer value during product development stage. This is to enable a venture to have a better chance of success without requiring large amounts of outside funding, elaborate business plan or high technology (Nash, 2013; Ries, 2011). It is a method of managing innovation and creating customer value

(York and Danes, 2014). Though it became popular with its initial application in the technology sector, lean start-up is now widely applied in other sectors of the economy (Blank, 2013; Nientied, 2015; Ries, 2011) and has equally attracted attention from the business world and the academia (Nientied, 2015). Lean start-up presupposes that new firms be innovative and have online exposure concurrently (Zijdemans and Tanev, 2014).

Lean start-up involves a small firm with lean organisational structure and work process and procedure, having unique features such as fast learning, risk reduction, waste elimination and greater efficiency (Erkinheimo et al., 2015). Lean start-up is used to develop innovative products and services based on customer's demand; where expenditures on resources are minimised in order to create value for customers. That is, if a firm develops a product that customers do not need, it amounts to a waste of resources including time and effort (Nientied, 2015). In the opinion of York and Danes (2014), lean start-up is a concept described as: start small, operate simply, and with innovative product and/or service, visit online platforms to create awareness and access crowd-funding. It is an enterprise development approach with emphasis on creation of customer value (through innovation) and waste reduction (York and Danes, 2014). Lean start-up focuses on the successful process of developing a good product or business idea (Nirwan and Dhewanto, 2015) that can be likened to the marketing concept where customers' needs are a firm's main concern. Furthermore, lean start-up emphasises the import of searching out customers' needs or problems (from customers' response to a prototype product advertised online) and then adjusting the product in line with customers' suggestion; and finally launching a new product to meet customers' needs or solve their problems. This helps to avoid business failure. It is a novel way of organising business development (Erkinheimo et al., 2015). Quick response to customers' demands in terms of product adjustment in order to avoid failure risk is the key to the success of lean start-up (Blank, 2013; Zijdemans and Tanev, 2014).

Lean start-up is one way for start-ups to expose their product or business ideas to a larger audience online. This helps the firms to secure funding, new customers, new ideas, investment and financial advice and quick customers' response; thereby reducing failure risk as well as saving cost and time (Erkinheimo et al., 2015). Funds can be secured through crowd-funding which has presented itself as a novel finance option for start-ups in recent times (Blank, 2013). Nash (2013) argues that the success of the venture depends on the type of project, quality of financial investment adviser, the entrepreneur's characteristics, and the actual action or execution of the project. Funds are accessed through a web of relationship with other people online. For example, an entrepreneur can visit an online platform or create one for himself, upload a sample of his product, fix affordable per unit price (little profit margin), do online advertising and get feedback from customers. Then the project or product begins to thrive and attract customers and sponsors if it is viable or valuable. Through lean start-up, customers' needs are exposed early and this eliminates the firm's waste of resources on future production (Kumar et al., 2013).

For proper understanding of the lean start-up concept, Ries (2011) gave three principles: the spaghetti principle, the build-measure-learn principle, and crunching the numbers principle. The spaghetti principle deals with an understanding of the minimum viable product. In simple terms, it suggests that an entrepreneur should send his product online, see the ones that customers accept through feedback, and quickly adjust the

product to meet customers' need so they can get value for their money. The build-measure-learn principle suggests that entrepreneur should continue to gather feedback from online customers regarding the new product (e.g. changes in product features, price, etc.) and continue to respond or adjust the product accordingly. Crunching-the-number principle suggests that it is only after data collection and analysis that the entrepreneur can make an informed decision.

2.2 Lean start-up: empirical evidence

In line with literature, this study was underpinned on Technology Acceptance Model (Davis et al., 1989) and Social Exchange Theory (Blau, 1964) to examine lean start-up as predictor variable; while entrepreneurial intention was tied to the Theory of Planned Behaviour (Ajzen, 1991) as criterion variable. As a basic foundation for this study, a review of previous empirical studies was necessary. For example, Zijdemans and Tanev (2014) investigated lean start-up on innovation processes in born global firms, and using a literature review approach of 32 peer-reviewed journals, concluded that the application of lean start-up in managing innovation avoids failure risks associated with marketing a half-baked product. York and Danes (2014), in USA, examined the relevance of lean start-up model to new product development and customer development, and with literature review method, suggested its application among entrepreneurs, enterprise support organisations, incubators and accelerators, and entrepreneurial educators. On the influence of crowd-sourcing on lean start-up companies in Finland, Erkinheimo et al. (2015) using literature method, concluded that crowd-sourcing could help outsource a firm's initial start-up capital as well as create awareness about a firm's market potentials and customers' needs. Nirwan and Dhewanto (2015), in Indonesia, looked at the barriers to lean start-up adoption. Using a qualitative approach (oral interview) for a case study of an online healthcare company and with a total sample of 60 patients, doctors and dentists found that accessing customers and the legal and administrative requirements involved in contacting customers were some of the barriers to lean start-up adoption among healthcare service providers in Indonesia. Nientied (2015), in Albania, investigated the adoption of lean start-up in a new university (8 years old), and with a qualitative research method (oral interviews), concluded that lean start-up is useful for a new university's and other new businesses' development. We, therefore, hypothesise that:

H: Lean start-up is positively related to youths' entrepreneurial intentions.

3 Methodology

3.1 Survey procedures

A survey method was used to solicit responses from 3rd year university undergraduate students at three Universities in Malaysia peninsula, using stratified random sampling. This is similar to that used by Vrioni (2011). With a population of 1,686 students, a sample size of 323 students from business faculties was used; determined by Yamane's formula ($n = N/1+N(e)^2$) for finite population, as cited in Israel (1992). Questionnaires

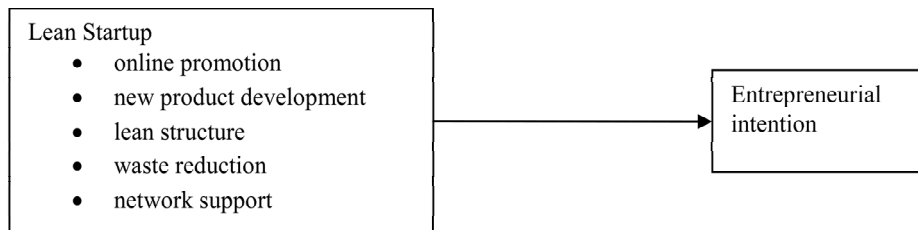
returned were 191. This represented 59% response rate which satisfied the minimum response rate of 30% suggested by Sekaran (2000). Actual field work was from February to March 2016. Third year students were the unit of analysis in this study because they had already spent most of their semesters in the university; thereby helping to examine their level of awareness of lean start-up. However, after data screening, data for 183 respondents were analysed using descriptive statistics and regression methods.

3.2 Measures

Lean start-up was operationally defined in terms of innovativeness (product development), customer focus, simplified organisational structure and online presence (Ries, 2011; Zijdemans and Tanes, 2014). However, this study defines lean start-up in terms of online promotion, new product development, simple organisational structure, waste reduction and online social network support. Measures were adapted from Ries (2011) and Mollick (2014) but measures for entrepreneurial intentions were adapted from Kennedy et al. (2003). All the measures were tapped on a 4-point scale.

The conceptual framework for this study is shown in Figure 1.

Figure 1 The conceptual framework of study



4 Results

4.1 Data cleaning

A series of data cleaning and treatment approach was used in this study. These include: identification and treatment of missing data, outliers, normality, multicollinearity and so on. In this study, there was no missing data. Also, in handling outliers, a table of chi-square statistics was used as a benchmark to determine the best values, in line with the suggestion of Hair et al. (2010) and Coakes and Steed (2003). For example, 8 cases of outliers were identified and deleted. This was achieved through Mahalanobis distance values which were greater than 61.10 critical or table values (at significant level of 0.001), corresponding to 31 predictor items or degree of freedom (Hair et al., 2010, p.66). This left 183 respondents for the analysis. Also, multicollinearity was examined through tolerance test ($1-R^2$) for each dimension of the predictor variable, where tolerance value of <0.10 is problematic (Hair et al., 2010). In this study, all tolerance values were >0.10 benchmark which indicated that the data were free from multicollinearity issue.

4.2 Goodness of measures

The principal component analysis (EFA) revealed that lean start-up converged into four components (waste reduction, lean structure, online promotion and online social network support) with a total variance explained (TVE) as 68.077% and measure of sampling adequacy (KMO) as 0.801. Entrepreneurial intention had one component (I will start a business if my family and friends will support me) with a total variance explained (TVE) as 70.283% and measure of sampling adequacy (KMO) as 0.731. However, new product development as an independent construct was kicked out from the EFA, and so was no longer considered in subsequent analysis. Details of EFA extractions are shown in Table 1 (a, b).

Table 1a EFA (IV) Rotated Component Matrix^a

| | <i>Component</i> | | | | | | |
|-----|------------------|----------|----------|----------|----------|----------|----------|
| | <i>1</i> | <i>2</i> | <i>3</i> | <i>4</i> | <i>5</i> | <i>6</i> | <i>7</i> |
| Q31 | .783 | | | | | | |
| Q33 | .744 | | | | | | |
| Q32 | .723 | | | | | | |
| Q30 | .675 | | | | | | |
| Q35 | .663 | | | | | | |
| Q34 | .583 | | | | | | |
| Q26 | | .835 | | | | | |
| Q25 | | .800 | | | | | |
| Q23 | | .773 | | | | | |
| Q24 | | .766 | | | | | |
| Q10 | | | .816 | | | | |
| Q11 | | | .777 | | | | |
| Q9 | | | .753 | | | | |
| Q20 | | | | .756 | | | |
| Q21 | | | | .734 | | | |
| Q22 | | | | .677 | | | |
| Q27 | | | | | .860 | | |
| Q28 | | | | | .806 | | |
| Q13 | | | | | | .840 | |
| Q14 | | | | | | .805 | |
| Q7 | | | | | | | .826 |
| Q6 | | | | | | | .758 |

Notes: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalisation.

^a. Rotation converged in 6 iterations.

Table 1b EFA (DV) Rotated Component Matrix^a

| | <i>Component</i> | |
|-----|------------------|----------|
| | <i>1</i> | <i>2</i> |
| Q46 | .878 | |
| Q45 | .873 | |
| Q44 | .754 | .318 |
| Q41 | .675 | .859 |
| Q43 | .663 | .689 |

Notes: Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalisation.

^a. Rotation converged in 3 iterations.

After the principal component factor analysis (EFA), the data were standardised (mean of items) to become variables for subsequent analyses such as ‘reliability’. However, for regression, the variables were centralised to avoid high multicollinearity (Aiken and West, 1991).

Reliability test was performed on the factors after the exploratory factor analysis. Alpha for lean start-up (waste reduction) was 0.812. Alpha for lean start-up (lean structure) was 0.867. Alpha for lean start-up (online promotion) was 0.771 and alpha for lean start-up (online social network support) was 0.700. Alpha for entrepreneurial intention (family/friends support) was 0.814. This is shown in Table 2.

Table 2 Descriptive statistics (M, SD) and reliability

| <i>Variable</i> | <i>Mean</i> | <i>Std. Dev.</i> | <i>Cronbach' alpha</i> | <i>Items after EFA</i> | <i>Sample (N)</i> |
|--|-------------|------------------|------------------------|------------------------|-------------------|
| Lean start-up (waste reduction) (LSWR) | 3.05 | 0.45 | 0.812 | 6 | 183 |
| Lean start-up (lean structure) (LSLS) | 3.19 | 0.45 | 0.867 | 4 | 183 |
| Lean start-up (online promotion) (LSOP) | 3.21 | 0.50 | 0.771 | 3 | 183 |
| Lean start-up (online social network support) (LSNS) | 2.95 | 0.49 | 0.700 | 3 | 183 |
| Entrepreneurial intention (family/friends support) (EIFFS) | 3.06 | 0.59 | 0.814 | 3 | 183 |

Source: Field Survey (2016)

Table 2 provided a summary of the descriptive statistics of the variables. It is evident that all the predictor variable (lean start-up) dimensions had direct relationship with the criterion variable (entrepreneurial intention) as depicted by their high Cronbach’s alpha, ranging from 0.700 to 0.867; and the mean ranging from 2.95 to 3.21. This proved that Malaysian business students perceive that lean start-up in terms of waste reduction, simple organisational structure, online promotion, and online social network support could influence their entrepreneurial intentions.

To examine the level of awareness and adoption of lean start-up among Malaysian youths, especially the business and entrepreneurship students, descriptive statistics (frequency distribution) was adopted. This is shown in Table 3.

Table 3 Frequency distribution showing awareness and adoption of lean start-up ($N=183$)

| <i>Item/Description</i> | <i>Option</i> | <i>Frequency</i> | <i>Percentage (%)</i> |
|---|---------------|------------------|-----------------------|
| I know about lean start-up | Yes | 54 | 29.5 |
| | No | 129 | 70.5 |
| I have heard about lean start-up | Yes | 84 | 45.9 |
| | No | 99 | 54.1 |
| I have received lectures/tutorials on lean start-up | Yes | 30 | 16.4 |
| | No | 153 | 83.6 |
| I know the usefulness of lean start-up | Yes | 45 | 24.6 |
| | No | 138 | 75.4 |
| I have used lean start-up to develop my new product or product idea | Yes | 6 | 3.3 |
| | No | 177 | 96.7 |

Source: Field Survey (2016)

Regarding the awareness of lean start-up model, it is evident in Table 3 that majority of the respondents (70.5%) did not know about lean start-up model in Malaysian public universities, especially in the business and entrepreneurship faculties. The result of the frequency distribution also revealed that most of the students (54.1%) have not even heard about lean start-up. Again, a higher percentage of the respondents (83.6%) have not received any lecture or tutorial on lean start-up in their universities, up to their third year. Furthermore, majority of the students (75.4%) did not know the usefulness of lean start-up. With respect to the adoption of lean start-up model, the frequency statistics showed that most of the respondents (96.7%) have not used lean start-up to develop their new product or product idea. In other words, out of the few (29.5%) who knew about lean start-up, only 3.3% adopted the model in their businesses or projects. The relationship between the variables was further examined through correlation analysis. This is shown in Table 4.

The correlation table shows that all the dimensions of lean start-up (waste reduction, lean structure, online promotion and online social network support) correlate with entrepreneurial intentions among the students. However, online social network support and waste reduction had the higher significant relationship on entrepreneurial intentions than online promotion and lean structure. The correlation analysis indicated that lean start-up (waste reduction), had positive relationship with entrepreneurial intentions ($r = 0.264^{**}$, $p \leq 0.01$). Correlation of lean start-up (lean structure) with entrepreneurial intentions was also positive ($r = 0.128^{**}$, $p \leq 0.01$). Similarly, correlation of lean start-up (online promotion) with entrepreneurial intentions was positive ($r = 0.179^{**}$, $p \leq 0.01$). Again, correlation of lean start-up (online social network support) with entrepreneurial intentions was positive ($r = 0.356^{**}$, $p \leq 0.01$).

Table 4 Pearson correlation analysis

| | <i>LSWR</i> | <i>LSLS</i> | <i>LSOP</i> | <i>LSNS</i> | <i>EIFFS</i> |
|---------------------------|-------------|-------------|-------------|-------------|--------------|
| LSWR Pearson Correlation | 1.000 | | | | |
| Sig. (2-tailed) | | | | | |
| N | 183.000 | | | | |
| LSLS Pearson Correlation | .318** | 1.000 | | | |
| Sig. (2-tailed) | .000 | | | | |
| N | 183 | 183.000 | | | |
| LSOP Pearson Correlation | .128 | .420** | 1.000 | | |
| Sig. (2-tailed) | .085 | .000 | | | |
| N | 183 | 183 | 183.000 | | |
| LSNS Pearson Correlation | .324** | .384** | .297** | 1.000 | |
| Sig. (2-tailed) | .000 | .000 | .000 | | |
| N | 183 | 183 | 183 | 183.000 | |
| EIFFS Pearson Correlation | .264** | .128** | .179** | .356** | 1.000 |
| Sig. (2-tailed) | .000 | .003 | .015 | .000 | |
| N | 183 | 183 | 183 | 183 | 183.000 |

Notes: *Correlation is significant at the .05 level (2-tailed).

**Correlation is significant at the .01 level (2-tailed).

Dependent Variable: Entrepreneurial intention (family/friends support) (EIFFS)

LSWR=Lean start-up (waste reduction), LSLS=Lean start-up (lean structure), LSOP=Lean start-up (online promotion), LSNS=Lean start-up (online social network support).

4.3 Testing hypothesis

Regression analysis was used to test the hypothesis earlier stated. The dimensions of the predictor variable (lean start-up) were regressed on the criterion variable (entrepreneurial intentions). This is shown in Table 5.

Table 5 Regression analysis of lean start-up on entrepreneurial intention

| <i>Variables</i> | <i>(IV-DV) Beta</i> | <i>Hypothesis</i> |
|---|---------------------|-------------------|
| Lean start-up (waste reduction) (LSWR) | 0.155** | H1 |
| Lean start-up (lean structure) (LSLS) | 0.038 | |
| Lean start-up (online promotion) (LSOP) | 0.063 | |
| Lean start-up (social network support) (LSNS) | 0.272*** | H1 |
| <i>R</i> square | 0.157 | |
| Adjusted <i>R</i> square | 0.138 | |
| <i>R</i> square Change | 0.157 | |
| <i>F</i> Value | 8.294 | |
| Sig. <i>F</i> . Change | 0.000**** | |

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$; **** $p < 0.001$

DV = Entrepreneurial intention (family/friends support) (EIFFS)

Hypothesis 1 predicted a positive relationship between lean start-up and youths' entrepreneurial intentions. The regression result in Table 5 revealed that the overall model was significant, accounting for 15.7% of the variance (R^2) in entrepreneurial intentions. This indicated that lean start-up has significant positive influence on the youths' entrepreneurial intentions. Specifically, waste reduction ($\beta = 0.155^{**}$, $p < 0.05$) had prominent significant positive effect on entrepreneurial intentions among university business students in Malaysia. Also, online social network support ($\beta = 0.272^{***}$, $p < 0.01$) had significant positive effect on youths' entrepreneurial intentions in Malaysia. Thus, hypothesis 1 was supported and therefore accepted. However, there was no evidence to support that lean start-up in terms of lean organisation structure and online promotion had any individual effect on entrepreneurial intentions among Malaysian business students. This is evident from the fact that the individual coefficient beta of lean structure and online promotion were insignificant. However, the overall regression model was significant (sig. F change = 0.000, $p < 0.001$), indicating that lean start-up has significant positive effect on youths' entrepreneurial intentions in Malaysia.

5 Discussion

The correlation analysis indicated that lean start-up (waste reduction), had positive relationship with entrepreneurial intentions ($r = 0.264^{**}$, $p \leq 0.01$). Correlation of lean start-up (lean structure) with entrepreneurial intentions was also positive ($r = 0.128^{**}$, $p \leq 0.01$). Similarly, correlation of lean start-up (online promotion) with entrepreneurial intentions was positive ($r = 0.179^{**}$, $p \leq 0.01$). Again, correlation of lean start-up (online social network support) with entrepreneurial intentions was positive ($r = 0.356^{**}$, $p \leq 0.01$). Comparing correlation and regression analyses, similar results were obtained. That is, in regression analysis, waste reduction ($\beta = 0.155^{**}$, $p < 0.05$) also had prominent significant positive effect on entrepreneurial intentions among university business students in Malaysia. Also, online social network support ($\beta = 0.272^{***}$, $p < 0.01$) had significant positive effect on youths' entrepreneurial intentions in Malaysia. Therefore, in summary, the study established a positive relationship between lean start-up and youths' entrepreneurial intentions.

The result of this study agrees with previous researches that lean start-up has significant effect on enterprise performance (Erkinheimo et al., 2015; Kumar et al., 2013; Nientied, 2015; Ries, 2011; York and Danes, 2014; Zijdemans and Tanev, 2014). For example, lean start-up had positive effect on organisational development through waste elimination (Nientied, 2015), and on enterprise innovation process through online social network supports (Ries, 2011; Zijdemans and Tanev, 2014). However, our work contradicts two previous works which discovered that online product exposure (promotion) and lean/simple organisational structure was positively related to a firm's growth (Ries, 2011) and market potentials (Erkinheimo et al., 2015) respectively. The variation in this result could, possibly, come from the study's unit of analysis (youths). Generally, youths' behavioural intentions mostly depend on their peer/friends support or advice (Ekpe and Mat, 2012). Therefore, lean start-up in terms of online social network support and waste reduction were more important to the youths' entrepreneurial intentions than online promotion and lean structure.

6 Conclusion

The overall model of lean start-up and entrepreneurial intentions among Malaysian business students was significant, indicating a positive relationship between lean start-up awareness and youths' entrepreneurial intentions in Malaysia. Also, from the descriptive statistics, the study discovered that most of the students neither knew about nor adopted lean start-up model to develop their new product or product idea. The study has helped to establish the fact that an awareness of lean start-up model could lead to entrepreneurial intentions of the students, and adoption of same could lead to new business establishment or business performance. Therefore, the government should incorporate lean start-up into the study curriculum of universities in order to make the lecturers and students aware and appreciate the usefulness of lean start-up method as one of the world's new enterprise development models currently in vogue. This would engender greater interest in venture formation especially among the youths. However, the study is limited to business students of universities in Malaysia. Future studies could examine the issues in the universities, colleges and polytechnics in Malaysia.

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