

Entrepreneurial universities and social capital: The moderating role of entrepreneurial intention in the Malaysian context[☆]

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ABSTRACT

The mismatch of skills among youth graduates contributes towards existing social and economic challenges of poverty and unemployment especially among youths in most developing countries including Malaysia. Consequently, universities are mandated to transform into Entrepreneurial Universities as a third mission, driving state of the art knowledge, skills acquisition and entrepreneurial mindset that supports technological development and innovations to match up with the emerging needs of Malaysia's economy. Therefore, this study assesses the influence of entrepreneurial universities on the development of social capital. Questionnaires were used to retrieve data from a sample of 382 students in two Institutions. Data were analysed using structural equation modelling (PLS-SEM). The direct relationships between the three measures of entrepreneurial university (Input, Process and Output) indicated a positively significant relationship with social capital. However, the moderating effects of Entrepreneurial Intention were supported. Our paper contributes to the literature by examining the role of Entrepreneurial Universities using the three factors of inputs, processes and outputs on social capital development and concurrently examining the moderating effect of Entrepreneurial Intention. It also provides evidence-based support to develop models for emerging entrepreneurial universities in Malaysia which can help the national goal of reducing unemployment due to skill mismatch among graduates.

1. Introduction

The prevailing economic change and the rising social challenges, especially relating to youth unemployment and skills mismatch demands a paradigm shift in knowledge transfer. Thus, the concepts of social entrepreneurs and entrepreneurial social capital have evolved in line with this paradigm. Interestingly the two concepts are all linked to social capital development (Leitch et al., 2013). Hence, social capital development, especially related to entrepreneurship, has been viewed as a viable solution (Fengqiao & Dan,

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2015). Developing social capital among groups is viewed as a tool that could facilitate the achievement of social and economic development goals of any region (Marzuki et al., 2014).

Many studies have concentrated efforts on understanding the antecedents or determinants of social capital. Notably, the determinants adding value to members in a social group such as the acquisition of relevant skills and knowledge that will encourage entrepreneurial mindsets (Jones et al., 2008) as well as support industries, social and societal needs (Budgen et al., 2014). Studies such as Tokas (2016), Alesina and LaFerrara (2000), and Putnam (2000) emphasised education as a critical factor in developing social capital. Andriani (2013) further acknowledged that Social Capital Theory (SCT) predicts that high degree of associations that occur in educational institutions like universities promote civic engagement, cooperation, reciprocity, and mutual trust (Marques et al., 2012). Furthermore, the Entrepreneurial University (EU) phenomenon is associated with increasing pressures universities face contributing to socio-economic development (Tung et al., 2020) such as the challenges of high skills mismatch and unemployment especially among graduate youths (Berton et al., 2017, Jones et al., 2011). It is termed as the *second academic revolution* or the *Third Mission* (Etzkowitz et al., 2008).

According to Salamzadeh et al. (2011), these changes could be observed in three different dimensions-i.e. inputs, processes and outputs-of any typical university. The main outputs of an EU are the entrepreneur's human capital, including graduates and staff (Salamzadeh et al., 2011). As a university transform its inputs, processes, and outputs towards an entrepreneurial mindset, they enhance students' entrepreneurial skills and develop the value of their social capital (Drost, 2010). Besides, studies suggested that the provision of entrepreneurship studies build up the entrepreneurial capacity of students in order to establish new social and economic ventures in the market (Timmons J & Stephen, 2004).

Although the evolving trend in Malaysia's educational system includes entrepreneurship education among graduates (Lee et al., 2011), a considerable number of Higher Learning Institutions (about 70%) still face difficulties in implementing it effectively (Rahim & Lajin, 2015; Radovic Markovic & Salamzadeh, 2012). Also, it is challenging that regardless of the theoretical interest in the link between entrepreneurial activities and social capital, few contributions have explicitly discussed the relationship between entrepreneurship and social capital (Ruef, 2010). In the one hand, some studies argue in support of the critical position of social capital as resources for entrepreneurs; this assertion has seen many researchers presume that social capital generally promotes entrepreneurship (Gilmeanu & Gauca, 2017; Marques et al., 2019). On the other hand, Gedajlovic et al. (2013) argue that social capital can also have a negative interference on performance and entrepreneurial outcomes.

This study, alternatively, explored the influence of entrepreneurial university dimensions-input, processes and output-on social capital development. Supported by Audretsch and Keilbach's (2004) argument that entrepreneurship is associated with some areas of social capital, empirical studies reveal that the theorised relationship between entrepreneurship and social capital is inconsistent. These mixed findings in literature have equally guided the choice of examining the moderating impact of entrepreneurial intention on the direct relationship between entrepreneurial university dimensions and social capital. According to Bullough et al. (2014), improving entrepreneurial intention is viewed as an essential step in an entrepreneurial plan at any time an individual intends to create a new business enterprise. It reflects a motivation based on which an individual would put planned decisions into action. The entrepreneurial intention of college students is the possibility of students to adopt entrepreneurship (Zhang et al., 2014).

2. Literature review and hypotheses development

Among popular theories and models in social sciences, Social Capital Theory remained dominant for over two decades now (Coleman, 1988; Fukuyama, 2000; Adler & Kwon, 2002). The SCT increased its popularity due to its versatility in providing a clear description of well-being among groups or individuals. The SCT considers capital to be a resource inherent to social interactions. Therefore, social capital represents the product of social relationships, in particular, factors such as self-confidence, trust, security, loyalty developed by youths from partaking in various groups within families, school, as well as other organizations. Besides, some researchers revealed the link between educational attainment and the development of different dimensions of capital among individuals (Rogosic and Baranovic, 2016).

The link between education and the emergence of social capital has been established by various studies based on the theoretical foundation of Coleman's (1988) or Barnett's (2003). Coleman traditionally approaches the concept in terms of the social capital available within the family; but they also considered social capital within communities (Rogosic and Baranovic, 2016). Bourdieu (2011) attempted to elucidate and verify that, when linked to the educational attainment of individuals, social capital tends to expedite social reproduction. Furthermore, according to Rogošić and Baranović (2016), social capital is linked to educational institutions (such as schools or universities). A group of researchers have also emphasised that both approaches in isolation cannot entirely explain the link of social capital with the education of individuals (Temporin, 2016).

The interaction amongst universities, industries, and the government is the foundation of the Triple Helix model (THM) (Marques et al., 2020). This tripartite relationship will breed the knowledge society and potential for innovativeness alongside economic development (Ranga and Etzkowitz, 2015). The improved mandate of universities in the tripartite relationship is required from numerous developmental perspectives. This new role of universities is outlined in their *third mission* that assigned universities with the mandate of socio-economic development as advancement on their traditional missions of teaching. Similarly, this is termed as the second academic revolution (Etzkowitz et al., 2000). Secondly, the university's unceasing capacity to stimulate students with novel skills, ideas, and talent-related entrepreneurship is a major asset of the knowledge society. Students are trained with an emphasis on entrepreneurial knowledge to motivate them to become entrepreneurs or start-up founders, therefore supporting economic growth through the creation of jobs and needed products (Ranga and Etzkowitz, 2015; Galvão et al., 2020; Rezaei-Zadeh et al., 2014).

Thus, universities have extended their potential through entrepreneurship and incubation programs, new training segments

(Etzkowitz et al., 2008; Almeida et al., 2012). According to Salamzadeh et al. (2011), a typical entrepreneurial university could be measured based on its inputs, processes and outputs. In line with the subsequent developments of Etzkowitz & Leydesdorff (2000), the concept evolved into a model employed by studies on the knowledge society dynamics. This also guides policymakers at various levels - international, regional or national. The triple helix model has, recently, evolved into the quadruple helix, adding the society to the three previously identified helixes.

Moreover, entrepreneurship education accomplishes a vital role in developing entrepreneurship among the younger population, and thus many researchers have highlighted the need for entrepreneurship education (Marques et al., 2018). According to the extant literature, the introduction of entrepreneurship education at the early stages of academic level provides positive effects to enhance entrepreneurial intention, creativity and attitude. Also, the intensity and experientialist nature of education has a significant impact on entrepreneurial orientation (Patankar & Mehta, 2014). The focuses on entrepreneurship education and knowledge transfer activities helped entrepreneurial growth in developed countries. Countries like USA, Canada and the European OECD countries are leading in promoting entrepreneurial processes (Patankar & Mehta, 2014).

Thus, the universities position as *isolated islands of knowledge* is no longer viable, leading to the institutions' increasing need to be more engaged with external affiliates through businesses (Zhang et al., 2014). The opportunities offered by this mission relates to universities creation of associations with industrial sectors through the establishment of university links, provision of licensing, research contracts, provision of consultancy and facilitation of mobility for researchers and graduates across sectors (Mascarenhas et al., 2017). This is considered as a component of the triple helix within the model of a knowledge society (Miller et al., 2016; Mok, 2013; Sperrer et al., 2016). Entrepreneurial universities provide a channel for extended effects which contributes towards socio-economic development through a collaborative mission that includes research, teaching as well as entrepreneurial events.

The innovative atmosphere in the entrepreneurial universities strengthens students' imagination and the development of more entrepreneurial intentions amongst students and teachers (Chang et al., 2016; Lee et al., 2011). Glaeser (2001) emphasised that a significant proportion of university education includes learning and cultivating social skills which contribute to the development of social capital. These skills are associated with the capacity to engage and interact with people, and these necessary skills of discussing or communicating proved to be valuable in the future development of social capital among individuals.

In terms of approaches to measure entrepreneurial universities, some studies offered distinct views. Gordon, Hamilton, and Jack (2010, 2014, 2015) explain that there are some principal models in extant literature notably those by Sporn (2001), Etzkowitz et al. (2004), Kirby (2005), and Rothaermel et al. (2007). While Gordon et al. (2010), based on their elaborated model, classified the factors determining the evolution to entrepreneurial university broadly into two dimensions, i.e., formal and informal. Formal factors include: "organisational structure and government support measures to university start-ups, and university entrepreneurship education programs". On the other hand, the informal elements include university attitudes towards entrepreneurship, entrepreneurship courses at university, role models, cases and university reward systems.

According to Salamzadeh et al. (2011), where the concept of evolution to entrepreneurial university was analysed using a systematic approach, entrepreneurial universities are dynamic systems that involve three different components of measurements: specific inputs (such as resources, structure, rules and regulations, entrepreneurial capabilities, mission, as well as societal expectations, industry, government and market); processes (such as teaching, research, logistical processes, commercialisation, selection, funding and financial processes, networking, multilateral interaction, and innovation, research and development activities); and outputs (such as practical research, entrepreneur human resources, innovations, inventions, entrepreneurial centres and entrepreneurial networks). These are all required for connecting resources, human and material assets towards achieving the transition to the entrepreneurial university.

2.1. Hypothesis development

The hypotheses developed in this study are proposed by considering the theoretical and empirical reviews on the variables of the study (Creswell et al., 2003, pp. 209–240). Besides, the relationship between the variables was discussed base on both theoretical and empirical reviews. This led to the development of the main hypotheses. Consequently, the moderating effect of the relationships was also hypothesised.

2.1.1. Entrepreneurial universities and social capital

Several studies indicated that entrepreneurship education is vital in developing the necessary mindset for entrepreneurship in student graduates (Anderson et al., 2007; Solomon et al., 2008; Guerrero et al., 2014; Guerrero et al., 2015a,b; Marques et al., 2018). Education, according to Putnam (2000); Alesina and LaFerrara (2000), is a major determinant contributing to social capital. Education expands the knowledge that is an essential component of human capital and cultivates social norms which represent social capital core. Universities have been acknowledged to offer some advantages with regards to engaging students with industries by serving as a hub for networking activities where people can meet, and knowledge can be exchanged (Youtie & Shapira, 2008).

Nevertheless, very few studies (Gordon, Hamilton, & Jack, 2010; Hayter, 2013) approached the role of educational institutions in shaping social capital. Although, Youtie and Shapira (2008), Hayter (2013), and Yousuf (2008) further argued that university's role in human capital development is highly recognised while very little has been known or studied regarding its role or ability to influence social capital. Audretsch and Keilbach (2004) also support that entrepreneurship is associated with certain parts of social capital, whereas the empirical literature to validate the theorised association between social capital and entrepreneurship has been inconsistent. Denny (2003) used a two-step method for exploring the cases of Italy, Northern Ireland, Britain and the Republic of Ireland. The outcome was a mixed finding, even though the observation was positive in terms of the relationship between education and altruistic

activities across the majority of the Western European provinces. [Dee \(2003\)](#) investigates the impact of education on the probability of joining social groups and volunteering in social services, and the impact on the number of affiliated groups. He confirms the substantial causal effect of schooling on most measurements of social participation, except for the frequency of voluntary work. Besides, changes in compulsory schooling law are applied in the studies of education and social trust. Likewise, [Milligan et al., 2004](#), apply this strategy in their study of educational return to trust and other civic outcomes. They do not identify any substantial variation between estimates result in both regressions approaches used. [Aldrich and Martinez \(2010\)](#) indicates that a positive relationship exists between social capital with entrepreneurship generally. Based on the reviewed literature, the following hypotheses are proposed:

- H1.** Entrepreneurial University Inputs positively influence Social Capital.
- H2.** Entrepreneurial University Processes positively influence Social Capital.
- H3.** Entrepreneurial University Outputs positively influence Social Capital.

2.1.2. Moderating effect of entrepreneurial intention

Only a few studies examined the role of educational institutions in shaping social capital ([Hayter, 2013](#)). Also, the few existing studies on the effect of the entrepreneurial university on social capital development have differed in their findings. Hence, there are mixed findings regarding the relationship between the entrepreneurial university and social capital development, especially in the entrepreneurship domain. Notably, some existing studies ([Youtie & Shapira, 2008](#); [Mukesh et al., 2018](#)) found a significant positive relationship between these two. On the contrary, other studies have reported a non-significant or negative effect of entrepreneurship education on entrepreneurial social capital. For instance, [Von Graevenitz et al. \(2010\)](#) argued that the effect of entrepreneurship courses on entrepreneurial intention of the students is negative. Also, in another study, it was found that the impact of entrepreneurship education in a compulsory course on students' self-assessed entrepreneurial skills was insignificant ([Oosterbeek et al., 2010](#)). Therefore, it is clear that these skills and mid-sets are latent in human capital which is the core for social capital. Another perspective on the negative effect can be seen when entrepreneurship education is succeeded in convincing those not suited to entrepreneurship that they should become entrepreneurs ([Oosterbeek et al., 2010](#)).

Furthermore, [Akçomak and Weel \(2009\)](#) also emphasised that “entrepreneurship is related to some aspects of social capital while the interplay between formal institutions and social capital has not been considered as a major research area and the empirical evidence to support the theorised link between Social Capital and entrepreneurship are also inconsistent”. This has lead to a vacuum of inconsistency in findings and thus in need to examine a moderation effect (e.g. as suggested by [Baron and Kenny \(1986\)](#)). Consequently, our study introduced entrepreneurial intention as a moderating variable between the hypothesised direct relationships in the study. Other studies found evidence that supports the positive effect of the entrepreneurial university on entrepreneurial intention (e. g., [Boukamcha, 2015](#); [Hultén & Tumunbayarova, 2020](#)).

[Lee et al. \(2011\)](#) further posited that: “the atmosphere for innovation on entrepreneurial universities can increase the entrepreneurial intention of teachers and students through job satisfaction and self-efficacy. Besides, social capital has a strong effect on career choices and can promote the entrepreneurial intention of younger generations ([Sharma, 2014](#)). Thus, the lack of entrepreneurship

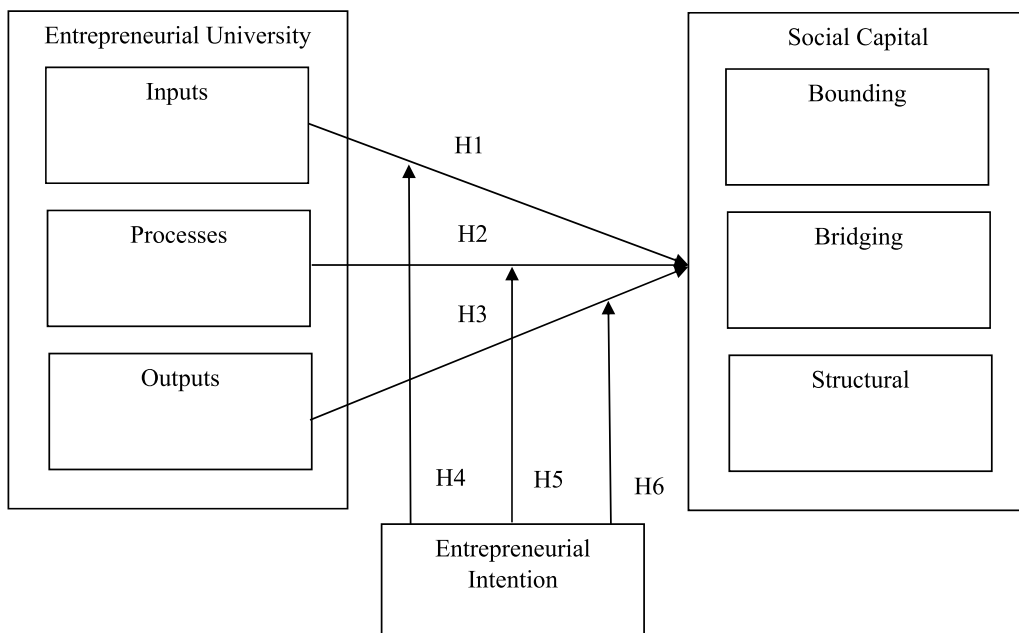


Fig. 1. Conceptual framework.

Table 1
The questionnaire structure.

Variables	Questions	Reference
Demography		
Demography	Name of University; Gender; Age Group; Education Level; Student Status; Race; Marital Status; Origin Nationality	Authors
Entrepreneurial University Inputs	<p>EUI1: My university has created structures to stimulate entrepreneurship</p> <p>EUI2: My university structure supports the development of entrepreneurial mindsets and skills among students</p> <p>EUI3: My university has increased the breadth and depth of education about entrepreneurship</p> <p>EUI4: My university has increased efforts towards producing job creators than job-seekers</p> <p>EUI5: My university has increased use of a range of entrepreneurial approaches such as teaching, promoting diversity and innovation among students</p> <p>EUI6: My university has extra-curricular activities to increase supports and maturity of entrepreneurial behaviour among students.</p> <p>EUI7: My university validates entrepreneurship learning outcomes</p>	Sooreh et al. (2011), Nigussie. (2016)
Processes	<p>EUP1: My university updates processes of entrepreneurial course content.</p> <p>EUP2: My university has committed to participate in knowledge exchange with various stakeholders such as industry, society and the public sector.</p> <p>EUP3: My university has involved in partnerships with various stakeholders including regional and local organizations, (SMEs), Schools, Alumni and entrepreneurs.</p> <p>EUP4: My university has links with incubators, science parks and other external initiatives to create opportunities for dynamic knowledge exchange in both directions.</p> <p>EUP5: My university supports students in knowledge exchange and collaboration with the external environment through formal or informal business/external entrepreneurial activities.</p> <p>EUP6: My university has put support systems to student mobility between academia and the external environment such as internships, teaching and research exchanges</p> <p>EUP7: My university shares its researches, with industry, entrepreneurs and the wider community through commercial and industrial partnerships or collaborations.</p> <p>EUP8: My university has an increased engagement in classroom teachings for local economic development.</p> <p>EUP9: My university has an increased engagement in scientific research for local economic development.</p> <p>EUP10: My university has increased the amount of spending on Research and Development.</p> <p>EUP11: My university has established technology transfer offices to market faculties' inventions</p>	
Outputs	<p>EUO1: My university attracts additional funding, borrow or raise money to invest in long term development independently.</p> <p>EUO2: My university has increased collaborations and partnerships with stakeholders such as communities, local organizations, chambers of commerce and alumni</p> <p>EUO3: My university integrates research results into entrepreneurship education and training to encourage the internal exchange of knowledge.</p> <p>EUO4: My university has the freedom to determine its entrepreneurial activities</p> <p>EUO5: My university provides the institutional free will to support innovative and interdisciplinary entrepreneurial activities</p> <p>EUO6: My university helps to drive projects forward with institutional effort and accountability to lead entrepreneurial projects towards success</p>	
Social Capital Bonding	<p>SC1: There is someone in my university that I can turn to for advice about making very important decisions.</p> <p>SC2: There are several people in my university that I trust to help solve my problems.</p> <p>SC3: If I need an emergency loan, I know someone in my university I can turn to.</p> <p>SC4: The people I interact with in university would put their reputation on the line for me.</p> <p>SC5: The people I interact with in university would share their last dollar with me.</p> <p>SC6: The people I interact with in university would be good job references for me.</p>	Cohen (1988), Krishna & Shrader (1999)
Bridging	<p>SC7: Interacting with people in my university makes me interested in things that happen outside of my town.</p> <p>SC8: My interactions with people in my university make me want to try new things.</p> <p>SC9: Interacting with people in my university makes me feel like part of a larger community.</p> <p>SC10: Interacting with people in my university makes me feel connected to the bigger picture.</p> <p>SC11: Interacting with people in my university reminds me that everyone in the world is connected.</p> <p>SC12: Interacting with people in my university makes me interested in what people unlike me are thinking.</p>	
Structural	<p>SC13: I am an active member of associations in my university</p> <p>SC14: I actively participate in all activities of my association</p> <p>SC15: I have several personal contacts with influential persons through my university</p> <p>SC16: I often talk with other people in my university and community about a problem</p> <p>SC17: I usually believe it is my responsibility to volunteer and participate in charitable organizations or any volunteer activities.</p>	
Entrepreneurial Intention (EI)		

(continued on next page)

Table 1 (continued)

Variables	Questions	Reference
Entrepreneurial Intention (EI)	EI1: I am determined to create a firm in the future. EI2: I am happy to take a risk as an entrepreneur. EI3: I prefer being employed by the government EI4: I prefer being employed by private firms EI5: I intend to start a business upon completion of my studies at the university EI6: I am likely to work very hard to become an entrepreneur. EI7: I am ready to start my own business.	Tofan, Bulawan & Halina, (2015), Cohen (1988)

education leads to a low level of entrepreneurial intentions among students. According to the study of [Mustapha and Selvaraju \(2015\)](#), social capital can directly influence the formation of entrepreneurial intention; meanwhile, it can also be influenced by entrepreneurial intention. Hence, the inconsistency in findings and the relationship between entrepreneurial intention and social capital”, the following indirect or moderating effects are hypothesised:

H4. Entrepreneurial Intention moderates the direct relationship between Entrepreneurial University Input and Social Capital development.

H5. Entrepreneurial Intention moderates the direct relationship between Entrepreneurial University Processes and Social Capital development.

H6. Entrepreneurial Intention moderates the direct relationship between Entrepreneurial University Outputs and Social Capital development.

2.2. Conceptual framework

The adopted theories in this study include the Social Capital Theory ([Coleman, 1988](#); [Barnett, 2003](#)), the Triple Helix Model ([Etzkowitz et al., 2008](#); [Galvão et al., 2020](#)), and the Theory of Planned Behaviour (TPB) ([Ajzen & Fishbein, 2004](#)). Social capital dimensions for this study include; Bonding, Bridging and Structural dimension ([Islam et al., 2006](#)). Entrepreneurial University is measured based on three factors; Inputs, Processes and Output ([Sooreh et al., 2011](#)). These relationships are depicted in [Fig. 1](#), representing the conceptual framework of the study. However, our literature review points out to three independent variables, with one dependent and moderating variable forming our conceptual framework.

3. Methods

3.1. Research design

A cross-sectional design was employed, and the researchers collected data once during a period. Besides, a quantitative approach was used to assess the direct relationships between the independent variable (IV) and the dependent variables (DV) as well as the moderating role of entrepreneurial intention on the relationships between the IVs and DV. These were measured using a survey.

3.2. Measurements for variables of the study

Social capital as the dependent variable for this study has the following dimensions: bonding, bridging and structural. Also, Independent variables were measured using entrepreneurial universities' Inputs, Processes and Outputs dimensions. Besides, Entrepreneurial Intention was used as a moderating variable in order to determine its moderating role on the strength of the relationship between Entrepreneurship Universities and Social Capital.

3.3. Instrumentation

The questionnaire included a series of items which were adapted from the existing instruments in relevant studies. This is in tandem with the recommendations made by scholars for social science researchers on the use of existing, tested scales for construct measurement. This is recommended mainly to ensure comparability of results and to avoid time and resource-intensive item development ([Diefenbach, 2011](#)). The questionnaire consists of four sections (see [Table 1](#)). It is also noteworthy that two of the seven items of entrepreneurial intention (EI3 and EI4) were initially measured using reverse coding hence, this study as well retained the items in reverse coding to measure EI. A five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) was used to measure all items of the questionnaire. Our instrument for data collection was drawn from the items and scales that have been already tested. The questionnaire included 24 items for the Entrepreneurial University: 7 items for inputs (EUI1-EUI7); 11 items for processes (EUP1-EUP11); 6 items for outputs (EUO1-EUO6). It also included 17 items for social capital (SC1 – SC17) and 7 items for Entrepreneurial Intention (EI1 – EI7).

3.4. Sample and data collection

The population for this study includes two samples of university students from Universiti Sains Malaysia (USM) and Universiti Utara Malaysia (UUM). The selection of these universities was based on the entrepreneurial status of the two universities. USM is highly recognised as a major entrepreneurial university and has won several entrepreneurship awards, such as in 2017 and lately in 2019; while UUM is an emerging entrepreneurial university considering its level of participation in various entrepreneurial activities in the country and the number of university and industry collaborations. For this study, the sample size was calculated from both universities-the total population for UUM and USM was respectively 27,527 and 30,670. Hence the total population for this study is 58,197 students.

Considering the total population size, using the rule of thumb by Krejcie and Morgan, a total of 382 samples were necessary. Thus, 535 questionnaires were distributed to students across the two universities. However, to decrease sample size error and accommodate non-respondent problem which generally occurs in survey research (Groves, 2006), this study adopted the commonly used method for adjusting sample size introduced by Salkind (1997). He suggested that the sample size could be increased by 40 percent to 50 percent to cover the possibility of “lost questionnaires and uncooperative subjects”. The sample size for this study, as estimated above was 382; the calculated 40% increase in the sample size was 153. Hence the total sample for this study was 535 university students. Proportionate sampling was, then, employed to determine the sample size for each university. For UUM, the distributed questionnaires’ number is 253, while this number for USM is 282. Data gathering stopped at the point we reached 382 samples including 194 from USM and 188 from UUM. The data was gathered between October 2019 and February 2020.

3.5. Data analysis techniques

In an attempt to shed light into the process of social capital development and entrepreneurial emergence or firm creation, this paper firstly tries to build a research framework which includes Entrepreneurial Universities dimensions and social capital with the moderating effect of entrepreneurial intention. This model was empirically tested using the Partial Least Square statistic technique.

3.6. Preliminary assessment

3.6.1. Non-response bias

The data collection process took place for nearly two months. In total, 382 valid responses were collected from the 535 distributed surveys, providing an acceptable response rate of 71.4%. In light of this response rate, the collected data were subjected to non-response bias analysis in the form of wave analysis. The dataset was split into subsets, namely ‘early responses’ (questionnaires

Table 2
Demographic characteristics of the respondents (N = 382).

Variables	Categories	Frequency	Percentage
Name of University	Universiti Sains Malaysia (USM)	194	50.8
	Universiti Utara Malaysia (UUM)	188	49.2
	Total	382	100
Gender	Female	247	64.7
	Male	135	35.3
	Total	382	100
Age Group	18–27	264	69.1
	28–37	80	20.9
	38 and Above	38	9.9
	Total	382	100
Education Level	Doctorate	51	13.4
	Master	107	28
	Undergraduate	224	58.6
	Total	382	100
Student Status	Full Time	339	88.7
	Online	6	1.6
	Part Time	37	9.7
	Total	382	100
Race	Chinese	74	19.4
	Indian	43	11.3
	Malay	185	48.4
	Others	80	20.9
	Total	382	100
Marital Status	Divorced	8	2.1
	Married	72	18.8
	Single	302	79.1
	Total	382	100
Origin Nationality	Malaysian	314	82.2
	Non Malaysian	68	17.8
	Total	382	100

returned during the first two weeks) and 'late responses' (questionnaires returned during the last two weeks). Based on the independent *t*-test, the findings demonstrated no significant differences between the two groups on all measures, revealing that the dataset did not suffer from non-response bias.

3.6.2. Common method variance (CMV)

To minimise and assess CMV, the current research used several techniques in two ways, namely procedural and statistical remedies. First, we tried to enforce procedural remedies by keeping the items concise and simple, reducing item ambiguity, and presenting a confidentiality and anonymity statement at the beginning of the questionnaire (Podsakoff et al., 2003; (Fuller et al., 2016). Second, we performed statistical remedies and found that no significant correlation, indicating that common method bias is not a concern in our study. In order to test the Common method bias in this research, we have used VIF criteria. The amounts must have been below 5 to show the absence of this bias. Some sources suggest values below 3.3 that are also fulfilled by our findings. Our findings showed that VIF values range between 1.135 and 2.920, all of which were below the threshold suggested by Hair et al. (2017) and Kock (2015).

4. Results

The PLS-SEM was considered an appropriate approach to assessing the proposed hypothesis in the current study. This involves a two-step approach whereby; the first step involves assessment of the validity and also reliability of the measurement model. The

Table 3
Convergent validity and reliability assessment.

Variable	Items	Loadings	CR	AVE
Entrepreneurial Intention	EI1	0.797	0.894	0.586
	EI2	0.835		
	EI3	0.603		
	EI5	0.736		
	EI6	0.798		
	EI7	0.802		
	EUI1	0.696		
EU Input	EUI2	0.722	0.881	0.515
	EUI3	0.734		
	EUI4	0.701		
	EUI5	0.712		
	EUI6	0.733		
	EUI7	0.722		
	EUI8	0.722		
EU Output	EUO1	0.769	0.883	0.558
	EUO2	0.728		
	EUO3	0.765		
	EUO4	0.737		
	EUO5	0.770		
	EUO6	0.709		
	EUO7	0.709		
EU Process	EUP1	0.713	0.932	0.556
	EUP10	0.769		
	EUP11	0.649		
	EUP2	0.739		
	EUP3	0.732		
	EUP4	0.759		
	EUP5	0.775		
	EUP6	0.752		
	EUP7	0.754		
	EUP8	0.766		
	EUP9	0.782		
Social Capital	SC1	0.722	0.948	0.536
	SC10	0.723		
	SC11	0.728		
	SC12	0.741		
	SC13	0.761		
	SC14	0.775		
	SC15	0.746		
	SC16	0.735		
	SC17	0.639		
	SC2	0.696		
	SC3	0.717		
	SC4	0.754		
	SC5	0.777		
	SC6	0.737		
	SC7	0.721		
	SC8	0.727		

Note: average variance extracted (AVE), composite reliability (CR).

subsequent step is to evaluate the hypothesised relationships or structural model. The outcomes are presented in the proceeding sections below.

4.1. Demographic profile of the respondents

The demographic features of the respondents, including gender, age, educational qualification, and marital status, are presented in Table 2. The respondents are 50.8% students of Universiti Sains Malaysia (USM) and 49.2% students of Universiti Utara Malaysia (UUM). The majority of the respondents are female (64.7%). Most of the respondents are within the age group of 18–27 (69.1%), while 20.9% are within the age bracket of 28–37, and 38 and above represent 9.9%. Most of the respondents are single (79.1%), 18.8% married, and 2.1% are divorced. Regarding the student status, most of the respondents are full-time students (88.7%), 1.6% are under the online study mode, while 9.7% of them are part-time students. In terms of residential category, Malaysians constitute 82.2%, while non-Malaysians constitute 17.8%.

4.2. Assessment of measurement model

The measurement model is assessed by applying two measures of validity—that are convergent and discriminant validity, and both results for measures of validity are presented below. Nonetheless, item number 9 (SC9) on social capital and item number 4 (EI4) on entrepreneurial intention were deleted according to their low indicator loadings.

4.2.1. Convergent validity

According to Table 3, the loading of items ranged from 0.639 to 0.835 (higher than the stipulated threshold of 0.50). Alternatively, convergent validity was also established from the composite reliability values. The result ranged between 0.881 and 0.948; these are also above the recommended value of 0.70 (Fornell & Larcker, 1981; Hair et al., 2017). Using the Average Variance Extracted (AVE) analysis, the values ranged from 0.515 to 0.586, which were above the recommended threshold of 0.50. These results indicated that the convergent validity was achieved (Hair et al., 2019).

4.2.2. Discriminant validity

We examined discriminant validity by assessing the Fornell-Larcker criterion (Fornell & Larcker, 1981), and the Heterotrait-Monotrait (HTMT) criteria (Henseler et al., 2015). Table 4 shows that using the Fornell-Larcker criterion, all the values for the discriminant validity were achieved since the result revealed that the square roots of AVE were greater than the relevant inter-construct correlations in the construct correlation matrix, thereby indicating enough validity for further analysis. Alternatively, discriminant validity was examined through the Heterotrait-Monotrait (HTMT) criteria. The HTMT values were revealed to be less than 0.85 (Table 5), thus confirming the discriminant validity of all given variables (Kline, 2016). The approach of Heterotrait-Monotrait (HTMT) ratio of correlations is considered to be stronger and more reliable (see Table 6).

Fig. 2 presents the loadings for all the items as much as the relationships between constructs (see Fig. 3).

4.3. Assessment of structural model

For this study, PLS-SEM technique was employed to measure the R^2 value. The four variables displayed an R^2 value of 0.637. This implies that 63.7% of the variation in Social Capital is accounted for by dimensions of the entrepreneurial university (inputs, processes and outputs), and entrepreneurial intention. The bootstrapping in PLS-SEM technique was used with 1000 re-sampling from 48 cases. The study found that the entrepreneurial universities Input ($\beta = 0.188$; $p < 0.001$), entrepreneurial universities process ($\beta = 0.178$; $p < 0.009$), entrepreneurial universities output ($\beta = 0.249$; $p < 0.000$) and entrepreneurial intention ($\beta = 0.317$; $p < 0.000$) had a positive and significant effect on social capital development among youths. Similarly, the moderating effect of entrepreneurial intention on the existing relationships between entrepreneurial universities input and social capital development was also significant and positive ($\beta = 0.10$; $p < 0.044$). The moderating role of entrepreneurial intention on the relationship between entrepreneurial universities process and social capital was also significant but negative ($\beta = -0.131$; $p < 0.040$). While, on the contrary, the moderating effect of entrepreneurial intention on the relationship between entrepreneurial universities output and social capital was not supported ($\beta = -0.017$; $p > 0.393$). Thus, the entire hypothesised relationships (H1 to H6) were found to be supported with only the exception of H6.

Table 4
Fornell-larcker criterion.

Variables	EU Input	EU Output	EU Process	Ent Intention	Social Capital
EU Input	0.717				
EU Output	0.674	0.747			
EU Process	0.701	0.706	0.745		
Ent Intention	0.504	0.551	0.519	0.766	
Social Capital	0.649	0.697	0.658	0.660	0.732

Table 5
Heterotrait-monotrait ratio (HTMT).

Variables	EU Input	EU Output	EU Process	Ent Intention	Social Capital
EU Input					
EU Output	0.797				
EU Process	0.796	0.798			
Ent Intention	0.571	0.622	0.564		
Social Capital	0.727	0.778	0.702	0.693	

Table 6
Hypothesis testing results.

Hypo thesis	Relationship	Beta	SE	T-Value	P-Values	Decision
H1	EU Input - > Social Capital	0.188	0.061	3.070	0.001	Supported
H2	EU Process - > Social Capital	0.178	0.075	2.386	0.009	Supported
H3	EU Output - > Social Capital	0.249	0.063	3.935	0.000	Supported
H4	Ent. Int*EU Input - > Social Capital	0.101	0.059	1.712	0.044	Supported
H5	Ent. Int*EU Process - > Social Capital	-0.131	0.075	1.751	0.040	Supported
H6	Ent. Int*EU Output - > Social Capital	-0.017	0.062	0.272	0.393	Not Supported

t values are computed through bootstrapping procedure with 48 cases and 1000 samples* $p < 0.05$, *** $P < 0.001$ (One tail).

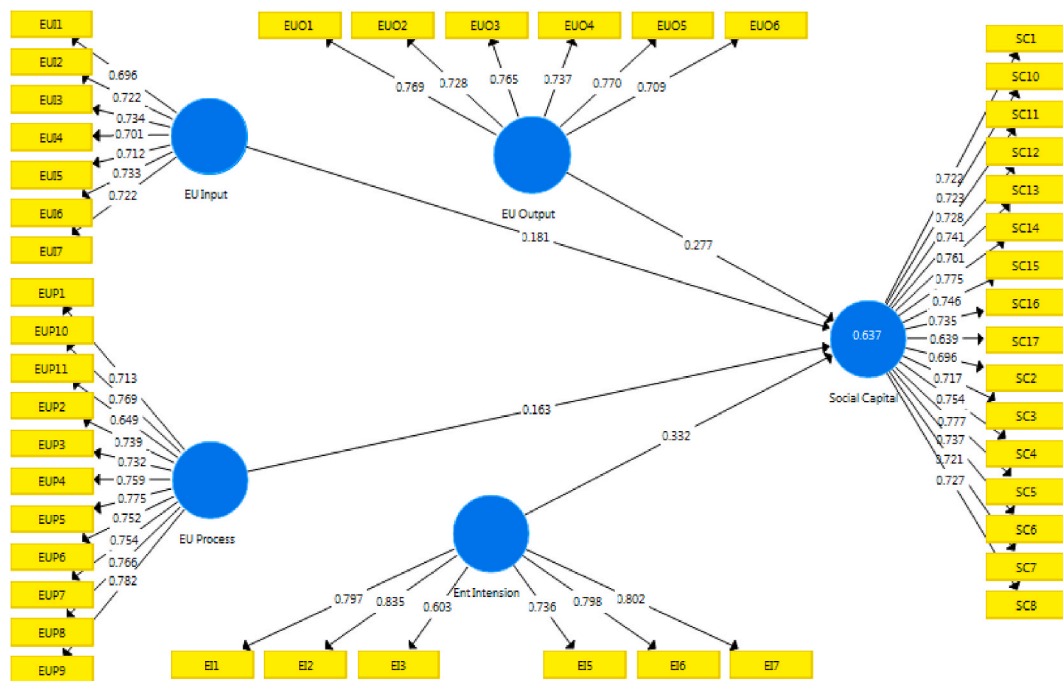


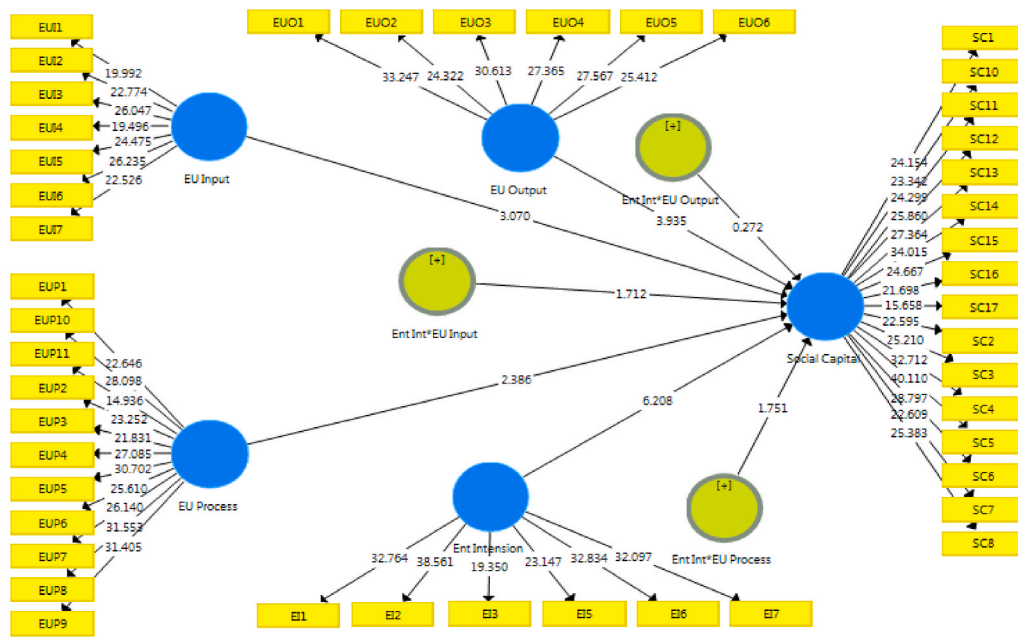
Fig. 2. Measurement Model of the study.

4.4. Assessment of effect size (f^2)

Table 7 shows the effect size of the following variables: EU Input, EU Output, EU Process and Entrepreneurial Intention with values as 0.039, 0.087, 0.029 and 0.197. Based on Cohen's (1988) recommendation, the results for the effect size suggest that they have Weak to Moderate effects. The weak contribution of each factor indicates that there is still room for further improvement of the inputs, processes and output structure to enhance the social capital development.

5. Discussion and conclusion

This study's objective is assessing the influence of entrepreneurial universities on social capital and the moderating effect of entrepreneurial intention based on hypothesised relationships. Entrepreneurial universities are perceived to be platforms for social interaction and social networks that form social capital. They invest in entrepreneurship development to do so. The current study has



* $p < 0.05$, *** $p < 0.001$ (One tail)

Fig. 3. Structural Model of the study.

* $p < 0.05$, *** $p < 0.001$ (One tail).

Table 7
Effect sizes of the structural model paths.

Variables	f Square	Magnitude of the Effect
EU Input	0.039	Weak
EU Output	0.087	Weak
EU Process	0.029	Weak
Entrepreneurial Intention	0.197	Moderate

shown that different dimensions of an entrepreneurial university, such as inputs, processes and outputs, have a significantly positive relationship with social capital. This indicates that changes in the university's teaching inputs system-from a conventional system to an entrepreneurial one-influence the development of social capital among students. Besides, the knowledge or networks derived through the inputs and processes in entrepreneurial universities serve to enrich each member's potential for entrepreneurship.

Moreover, the outcomes are in agreement with the extant literature that confirms the significant and positive influence of entrepreneurial university on social capital (Gordon et al., 2010; Taylor et al., 2004; Hayter, 2013; Sharma, 2014). These findings could be associated with the process of transforming into the Third Mission, evolving into entrepreneurial universities-a change in their inputs, processes and outputs towards entrepreneurship-, or improved industry-driven research. Consequently, all of these better exposes individuals to the acquisition of relevant knowledge that strengthens the value of the different social capital dimensions among its populations. The inputs and processes of an entrepreneurial university are breeding platforms for social capital through a network of interaction between experts/professional, and thus, prepare graduates with great potential for starting new ventures as entrepreneurs. The study concludes that entrepreneurial universities encourage the development of social capital. Therefore, promoting the transformation of universities in Malaysia into entrepreneurial universities could support the national goal of reducing the skills mismatch and youth unemployment.

Besides, it was considered that the prior entrepreneurial intention among youths could also strengthen the hypothesised relationship between entrepreneurial universities and social capital development. Our findings indicate that entrepreneurial intention only moderates two of the relationships. The moderating effect of entrepreneurial intention was found to be significant and positive for the case of entrepreneurial university input and social capital, while it was significant and negative for the case of entrepreneurial university process and social capital. In contrast, the case of entrepreneurial university output and social capital was found to be insignificant. Indeed, if entrepreneurial universities have already reached considerable outputs, improving the entrepreneurial intention of their students could not affect their social capital greatly, and vice versa. Besides, more entrepreneurially intended students who rely on the outputs of their universities might considerably mitigate the existing relationship between the outputs and social capital. Future researchers could examine this proposition. Accordingly, youths with prior entrepreneurial intention could further

increase the strength of the relationship between entrepreneurial university inputs and social capital development. Also, the evidence did not support the moderating effect of entrepreneurial intention for entrepreneurial universities outputs and social capital development. Therefore, the result points to the vital function that entrepreneurial intention plays to increase further the relationship between entrepreneurial university inputs and social capital development. This confirms the findings of some previous related studies (Alcaniz et al., 2010; Austin & Nauta, 2016; Hockerts, 2015; Ozaralli & Rivenburgh, 2016; Razmi & Firoozabadi, 2016; Sharma, 2014; Van Auken et al., 2006). The negative outcome for the case of moderating effect of entrepreneurial intention on entrepreneurial universities processes with social capital development may be attributed to the fact that the processes in Malaysian universities are still evolving and not fully developed despite the large investment in the input factors by government and other stakeholders in Malaysia. Moreover, if the students become more entrepreneurially motivated and want to rely on the existing processes of their universities, this might affect their entrepreneurial activities, as well as their developed social capital. Future researchers could investigate this proposition.

5.1. Implications

This study further contributes to the literature by examining the role of entrepreneurial universities using their three dimensions-i.e., inputs, processes and outputs-on social capital development. Besides, it simultaneously examines the moderating effect of entrepreneurial intention. For which to the best of our knowledge, there is no existing study employing the current framework. Practically, studies have emphasised the role of universities as an origin of social capital development and consequently, entrepreneurial skills. Therefore, it is paramount, especially in the context of Malaysia to emphasise employment creation through entrepreneurship education among university graduates. This is important considering that unemployment fuels poverty and additionally, unemployed youths are a potential social and political problem and other bandwagon effects. Many unemployed youths drift into crime and other social illnesses (Springborg, 2011; Eurostat, 2014).

In sum, on the other hand, this research is not only a pioneer in this field in the Malaysian context but also contributes to the extant literature by proposing a measurement scale for entrepreneurial universities. Our finding on the importance of entrepreneurial intention also helps decision-makers to consider this component in their policies. Many policies about entrepreneurial universities concentrate more on the hard aspect of it, and the soft aspects are ignored in many cases. Besides, the current research aims to shed some light on the importance of entrepreneurial intention as a soft concept related to the third generation of universities.

5.2. Limitations and recommendation for future study

Among the limitations of this research is that cross-sectional data was used, which limits the observation to a particular time. This study only focused on students of two universities in Malaysia due to time and resources limitations. The use of a single country did not allow an in-depth exploration of the role of culture on social capital when combined with the dimensions used in this paper. A cross-country research would, potentially, provide insights into this issue.

Similarly, university lecturers and other staff were not considered in this study. Future studies should, therefore, consider a time series approach to explore the variation in trend as a result of the transformation to entrepreneurial universities. Future studies should also broaden its scope to capture other entrepreneurial universities in Malaysia. Similarly considering that this study only focused on students, lecturers, and other universities staff should also be considered in future studies. Besides, future studies may also include intrapreneurship as means to assess the development of social capital. The literature suggests that the dynamics of entrepreneurial universities could determine the magnitude of their impact on the community. Therefore, one might conclude that the universities' impacts on the community depend on the levels of intrapreneurship amongst its academic and non-academic staff. Finally, since the relationship between the outputs of entrepreneurial universities and social capital was not supported, future researchers could test this hypothesis in a broader population from various universities in order to cross check this result.

Author statement

Yashar Salamzadeh: Conceptualization, Methodology, Resources, Software, Formal analysis, Supervision. **Taofeek Adeyemi Sangosanya:** Software, Data curation, Visualization. **Aidin Salamzadeh:** Project administration, Writing- Conceptualization, Original draft preparation, Reviewing and Editing. **Vitor Braga:** Conceptualization, Writing- Reviewing and Editing, Validation, Funding acquisition.

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