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# Human Capital and Open Innovation: Do Social Media Networking and Knowledge Sharing Matter?

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**Abstract:** This study provides empirical evidence of the effect of human capital on innovation in young entrepreneurs' SMEs. Furthermore, this study also examines the role of social media networking and knowledge sharing, as a mediating variable, on the effect of human capital on open innovation. The current study employs the survey method to collect data. The respondents of this study are 438 young entrepreneurs who attended incubators by universities in Central Java and Yogyakarta, Indonesia. Data analysis techniques include using Structural Equation Modeling (SEM) with AMOS software. The result shows that human capital, knowledge sharing, and social media networking directly affect innovation. Social media networking and knowledge sharing partially mediate the effect of human capital on innovation.

**Keywords:** human capital; social media networking; knowledge sharing; innovation; a young entrepreneur



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## 1. Introduction

Young entrepreneurs have an essential role in economic development for several reasons. First, people 15–29 years old make up 26% of the proportion of the world's population. Second, young entrepreneurs create jobs for themselves and others. Third, it has the potential to positively influence society in terms of innovation [1]. An entrepreneur is a person who has his own business by trying to create value and increase economic activity by identifying and exploiting new products, processes, or markets [2]. Someone can be included in the young entrepreneur's category if they are between 15–29 years old.

In order to face intense business competition, young entrepreneurs are required to create a competitive advantage. A key component for young entrepreneurs to survive and grow in a dynamic and competitive environment is innovation [3]. The previous study shows that innovation has a significant effect on performance [4,5]. Companies with more innovation will have more probability to achieve better performance [6]. There is a positive effect of innovation activity to form performance. Thus, it is suggested that a company spends more of its resources to improve the firm's innovation capability. Furthermore, it helps the company with better performance [7,8]. The innovation process requires a lot of knowledge, experience, intelligence, and education from human resources or human capital [9]. Generally, human capital is seen as the most fundamental knowledge asset in organizations [10]. An organization will excel in innovation if it has a good understanding of developing creativity in its human capital [11]. Previous studies show the importance of intellectual capital on innovation [10,12,13] and especially the role of human capital, as part of intellectual capital, to improve innovation [14,15].

One important aspect that has emerged recently is open innovation [16]. Companies work to adopt open innovation to improve firm performance [17]. Previous studies provide an argument for the importance of the study of open innovation [18–21]. Antecedent factors such as technological innovation technology [22], human resources [23], and knowledge management [24] have a significant effect on open innovation.

A previous study has highlighted the importance of human capital for innovation performance. Several studies have shown the positive effect of human capital on innovation, e.g., Delgado-Verde, Cooper [9]; Buenechea-Elberdin, Sáenz [10]; Dakhli and De Clercq [25]; De Winne and Sels [26]; Kianto, Sáenz [12]; and Prajogo and Ahmed [27]. Some results show that there is no effect of human capital (education and experience) on innovation e.g., [28,29]. Consistent findings indicate the possibility of certain variables that mediate the effects of human capital on innovation. The inconsistency of the findings indicates the possibility of certain variables that mediate the effect of human capital on innovation. Therefore, it is essential to test which mediation variables play an important role in increasing the effect of human capital on innovation.

Resource-Based View (RBV) theory states that unique and scarce resources become a competitive advantage for the company [30,31]. These resources include human capital, which Schultz [32] defines as the knowledge, skills, or abilities of employees in the organization. Organizational knowledge comes from human capital, while the creation of innovation comes from that knowledge. If an organization develops its human capital, including knowledge, skills related to creativity, and the development of new ideas, then innovation will be created [33,34]. However, in creating innovation, knowledge that is initiated by an individual needs to be shared with all employees in the company [35]. Human capital is a form of tacit knowledge within each individual, and in order to change it into organizational knowledge, it must be shared with other employees. Thus, the existence of knowledge sharing is fundamental to making human capital create innovation. In this digital era, social media in various forms has created a context for entrepreneurial activities and new businesses by providing information and knowledge-sharing spaces and providing opportunities to enhance innovation and economic growth [36].

Young entrepreneurs' way of taking advantage of information and technology includes social media to implement knowledge sharing. Knowledge sharing allows the knowledge that individuals or groups own both from within and outside the organization to be transferred to the organizational level to develop new products, services, and processes [37]. This fact supports social network theory, which focuses on the role of social relationships in conveying information through media, enabling behavioral change. A company has the opportunity to strategically use social media networks to increase the firm's capability to improve innovation performance [38]. Social media networks also provide a platform to interact more closely with the customer and enhance innovation capability [39]. Previous studies provide empirical evidence of the effect of social media networks on innovation [40–42].

The research questions of this study are (1) does human capital affect innovation? (2) do social media networks mediate the relationship between human capital and innovation?; and (3) does knowledge sharing mediate the relationship between human capital and innovation? Furthermore, the research objective of the current study consists of three objectives. First, the current study provides empirical evidence that human capital improves innovation. Secondly, the current study demonstrates the role of social media networks in mediating the relationship between human capital and innovation, and thirdly, the current study demonstrates the role of knowledge sharing to mediate the relationship between human capital and innovation.

This study focuses on the effect of human capital and innovation on young entrepreneurs in developing countries—in this study, Indonesia. It becomes interesting because developing countries face more challenges with information technology compared to developed countries. However, social media users in developing countries spend more time on them compared to developed countries. It provides an opportunity for the company

to explore social media networks. Indonesia has the second-highest rate of active social media use in Asia [43]. Furthermore, there are differences in the quality of human capital between developed and developing countries, which raises the question of whether it will affect innovation performance. This study contributes to innovation literature in three important ways. First, our findings link two kinds of literature that have not been much highlighted in previous studies—human capital and innovation. Second, we demonstrate the role of internet social media networks in mediating the effect of human capital on innovation. Third, we discuss how the role of knowledge sharing contributes to translating internet social media networks to improve innovation.

## 2. Materials and Methods

### 2.1. Literature Review and Hypotheses Development

#### 2.1.1. The Open Innovation of Young Entrepreneurs' Context in Indonesia

Based on data from the 2018 Survey of Entrepreneurs and MSMEs in Indonesia, there is a gap between the number of young entrepreneurs (40%) and old entrepreneurs (60%) of the respondents. This is because Indonesia has not provided strong support for entrepreneurial activities and innovation [44]. In fact, in very tight emerging market competition, it is necessary to support young people to become entrepreneurs [45].

Young entrepreneurs face big challenges in high competition in this global era. The main obstacle for young entrepreneurs is that the ability to innovate is still weak [1]. This can be seen from the ranking of the Global Innovation Index in 2021, in which Indonesia ranked 87th out of 132 countries. In addition, Indonesia also ranked 120th in terms of the ability of countries and industries to innovate. Based on data from the MSME survey in Indonesia by the Asia Foundation of Canada, the main problem for innovation according to the survey is the lack of investment in Research and Development (R&D) and the lack of skills. Indonesia only budgeted around 2% of GDP for (R&D), which is less than Singapore and Vietnam by 2.5% [44].

The challenge faced by the Indonesian government is overcoming unemployment caused by the lack of employment opportunities, especially for educated young people. Meanwhile, entrepreneurship offers opportunities for someone to create job opportunities for themselves and others. Thus, it is crucial to provide education and formal training and encourage the development of entrepreneurial skills at universities as a means of helping young Indonesians become young entrepreneurs. Young entrepreneurs can push the country out of the crisis through entrepreneurship. This is because young entrepreneurs have high creativity and the ability to utilize information technology to create competitive advantages [44].

Open innovation is one of the mechanisms to provide the growth of SMEs in Indonesia [18]. Young entrepreneurs have the opportunity to grow with the current form of open innovation [16], especially with the founder in SMEs that have higher entrepreneurial characteristics [46]. Entrepreneurs have significant relations with open innovation [47] to create an impact on social and business values [48].

#### 2.1.2. The Effect of Human Capital on Knowledge Sharing

Knowledge is a crucial factor in gaining a competitive advantage. There are two kinds of knowledge, including explicit knowledge and tacit knowledge. Explicit knowledge is the knowledge that is easier to communicate, process, send and store. Meanwhile, tacit knowledge is the knowledge hidden in the individual that is more personal and difficult to communicate. Thus, it is necessary to communicate this knowledge to other employees so that it becomes the knowledge of the company; thus, knowledge sharing plays an important role. Social Cognitive Theory explains that the behavior of every person is shaped, controlled, and influenced by social networks and individual cognition. Based on this theory, if individuals do not have the confidence to share knowledge, they will not share it [49]. Human and social factors are essential factors in the process of knowledge sharing. Researchers argue that if training and character building are built for employees to

increase their loyalty to the company, self-confidence and the intention to share knowledge will be built to share their knowledge. The hypothesis developed is:

**H1.** *Human capital has a positive effect on knowledge sharing.*

### 2.1.3. The Effect of Human Capital on Social Media Networking

The formation of creative ideas and innovation occurs because of constant interaction with the environment. Thus, social networking enables companies to exchange information, get problem-solving ideas, identify new opportunities and find new markets [50]. The ability to link specific knowledge and commercial opportunities require certain knowledge, insights, and skills. In their study, Mosey and Wright [51] found that the level of education and experience possessed by the owner affects the ability to develop social networks. A higher level of experience and education that an entrepreneur has will lead to more effective social network development.

The current development of information and technology provides opportunities for SMEs to take advantage of social media to build networks. The open innovation trend supports the entry of more networks and expanding the ecosystem through the internet of things, such as social media networks [52]. The hypothesis developed is:

**H2.** *Human capital has a positive effect on social media networking.*

### 2.1.4. The Effect of Human Capital on Open Innovation

Human capital is a set of knowledge, skills, and abilities that are embedded in the company's employees [26]. Organizations cannot create knowledge without individuals. Knowledge creation and innovation are processes where the hidden knowledge is internalized as part of organizational knowledge [37]. Employees who have higher education will be easier to adapt to new tasks and technologies [28]. In addition, companies that have a high level of human capital will be easier to create knowledge and innovation. The literature also shows that innovation activities increase because of the exchange and combination of existing knowledge [53].

A study by Hayton and Kelley [54] concludes that individuals with high cognitive, educational, training, and practical capabilities tend to be more innovative. The conclusion from the results of the study conducted by [26] is that human capital is an important determinant of innovation. In contrast to the results of that study, Capozza and Divella [28] and Hsu [55] show that human capital has no direct effect on innovation. This shows that there are inconsistencies in the results of a study on the effect of human capital on innovation.

A previous study shows that strategic human resources management has a significant effect on open innovation [23]. The better practice of human resources management provides a better environment to develop open innovation practices. Strategic human resources, such as human capital, have positively influenced open innovation. Furthermore, top management knowledge as part of human capital has a positive effect on open innovation [17]. Thus, the next hypothesis is as follows:

**H3.** *Human capital has a positive effect on innovation.*

### 2.1.5. The Effect of Social Media Networking on Open Innovation

The innovation process requires the integration of internal and external knowledge obtained from within the organization and outside the organization [56]. An open innovation approach enables SMEs constrained by limited resources, to seek, gather, and absorb knowledge from the external environment [40]. The development of information technology provides opportunities for young entrepreneurs to use it to innovate, one of which is through social media networking. Through social media, young entrepreneurs can establish reciprocal social relationships to build relationships, trust, norms, and networks [42]. Social media networking is an open-source online platform that is based on dyadic ties that come from individuals to the collective. Thus, young entrepreneurs can

seek and transfer knowledge by involving various users without any geographical and organizational limitations [40].

Networks enable SMEs to synthesize information and knowledge to create new knowledge and achieve innovation [57]. The relevance of social media networking for innovation has been debated by some previous researchers [56]. A result of a study shows that social media has a positive effect on the process of creating value that will drive the innovation process. Meanwhile, another study [40], which focuses more on social media networks, provides the conclusion that SMEs that adopt social media networks can increase innovation and the creation of new products. Previous studies also show the significant effect of social media on open innovation [58,59]. Thus, the next hypothesis is as follows:

**H4.** *Social media networking has a positive effect on innovation.*

#### 2.1.6. The Effect of Knowledge Sharing on Open Innovation

Knowledge sharing in the context of social media is defined as a condition where an individual shares knowledge with others through social media or vice versa [60]. When young entrepreneurs face competitive pressures in a dynamic economic and social environment, knowledge becomes a source of competitive advantage in their business. Entrepreneurs need to capture strategic knowledge. The current technological sophistication through the internet and digital tools enables entrepreneurs to obtain sources of knowledge easily [55].

Innovation not only involves technology but also, the most important thing is how the knowledge is collected and put together in a configuration [42]. Existing knowledge in an individual is a raw material for creating knowledge and innovation, but it will not be very meaningful if the individual does not share it with others. This is because the knowledge that is not shared will remain in the individual domain, so it will be difficult to create innovation. Therefore, knowledge sharing is the most important part of innovation because it allows SMEs to combine ideas, views, facts, and information so that new knowledge can be created to create and innovate [37].

A previous study provides evidence on the effect of knowledge sharing on innovation. Seidler-de Alwis and Hartmann [61] show that organizations that implement knowledge sharing will be more successful in innovating. A study conducted by Ebrahimi, Ahmadi [36] provides empirical evidence of knowledge sharing in encouraging the creation of new ideas for innovation. Thus, the hypothesis is as follows:

**H5.** *Knowledge sharing has a positive effect on innovation.*

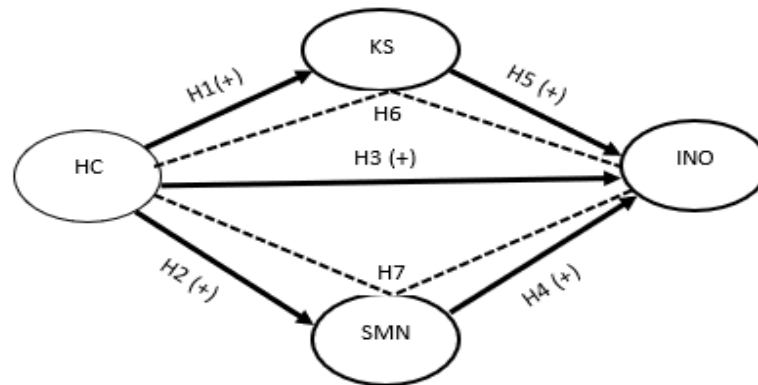
#### 2.1.7. Mediating Effects

Human capital represents company-specific assets that are unique and cannot be imitated by competitors. Knowledge, skills, and experience embedded in individuals play an important role in the innovation process [32]. Entrepreneurs who have a high level of human capital will tend to collaborate with external relations to exchange information and knowledge to create innovation [52]. The entrepreneur's typical ability to coordinate knowledge spread among different individuals is learned through education and previous work experience [62]. Coordination of this knowledge can be done through social media networking by combining team members to communicate effectively.

The creation of knowledge is intrinsically related to corporate human capital. Individuals with a high level of knowledge, skills, and experience become a source of new ideas for the company. Innovation activities occur because of the exchange and incorporation of knowledge. Thus, higher human capital has a more excellent opportunity for the process of knowledge exchange [63]. Knowledge sharing can be a means to pass on specific knowledge and can increase organizational knowledge competencies. In order to create innovation, young entrepreneurs can exchange knowledge through network connections without organizational boundaries [53]. Figure 1 provides the research model of the study and the structural relationship between variables. Thus, the sixth and seventh hypotheses are:



- H6.** Knowledge sharing mediates the positive relationship between human capital and innovation.
- H7.** Social media networking mediates the positive relationship between human capital and innovation.



**Figure 1.** Conceptual Model. Notes: HC = Human Capital. SMN = Social Media Networking. KS = Knowledge Sharing. INO = Innovation.

2.2. Methodology

2.2.1. Data Collection and Sample

Data is collected through surveys of young entrepreneurs who have attended incubators at the University. The survey was conducted using Google Docs (online questionnaire). Questionnaires were distributed through WhatsApp groups of young entrepreneurs empowered by some universities in Central Java and Yogyakarta. The sampling technique in this research was random sampling. There were 465 responses received, but only 438 could be used because some responses were incomplete.

In this study, we define SME according to Indonesia Law No. 20 year 2008. A small-medium enterprise is a productive business owned by an individual or an individual-owned business entity that meets the criteria of a micro business. Table 1 provides descriptive statistics of the study. Criteria for micro, small and medium enterprises based on Law No. 20 of 2008 are as follows:

1. Micro-enterprises include: (1) have maximum net assets around USD 3369.55, excluding land and buildings; (2) have sales/year around USD 20,217.27;
2. Small enterprises: (1) net assets owned between USD 3369.55–33,695.45, excluding land and buildings (2) sales/year of USD 20,217.27–168,477.25;
3. Medium-sized enterprise: (1) net assets between USD 33,695.45–673,909.00, excluding land and building for business; (2) sales revenue/year is USD 168,477.25–3369,545.00.

**Table 1.** Descriptive Statistic of Respondents.

Respondents	Measure	Total of Respondents	
		n	%
Gender	Male	195	44.5
	Female	243	55.5
Age of SMEs	<2 years	143	32.6
	2–5 years	272	62.1
	>5 years	23	5.3
Criteria	Micro	233	53.2
	Small	158	36.1
	Medium	47	10.7
Types of Business	Food	140	32.0
	Craft	21	4.8
	Fashion	107	24.4
	Service	144	32.9

Source: AMOS 25.

### 2.2.2. Measures

#### Human Capital

Six items were adopted from [4] to measure human capital from SMEs. By using the Likert scale 1–5, respondents were asked about how much funds were allocated for training employees, training conducted for employees, employee skills in carrying out tasks, employee loyalty, employee education, and employee motivation in working.

#### Innovation

Innovation is measured by using a composite index of various types of innovations developed by [64]. Respondents were asked to answer questions about how often the various types of innovations are carried out by SMEs on a Likert scale of 1–5. The types of innovation include product innovation, services, and operational processes, as well as organizational and marketing methods.

#### Social Media Networking

We adopt the instrument used by Pratono [42] to measure the social media networking variable. There are four questions for the respondents on how often with Likert scale 1–5 about the number of business relationships established, communication with business partners through social media, product development through social media, and contribution to business decision making through social media.

#### Knowledge Sharing

This research use instruments developed by Kwahk and Park [60] to measure knowledge sharing. Question items addressed to respondents include how often they share knowledge through social media, how much time they spent sharing activities through social media, how active they are in knowledge sharing activities with others through social media, how much interaction is done in discussing business difficulties in social media, and how often they participate discussions through social media. Measurement is done using a Likert scale of 1–5.

The data analysis technique uses a Structural Equation Model (SEM) using the AMOS 25 software. This SEM method is used to analyze the direct effect of human capital on innovation; human capital on knowledge sharing; human capital on social media networking; knowledge sharing on innovation; and social media networking on innovation. Furthermore, the SEM method is also used to indirectly check (1) human capital to innovation, with knowledge sharing as the intermediate variable, and (2) human capital to innovation, with social media networking as the intermediate variable.

## 3. Results

### 3.1. Goodness of Measures

Testing the validity of the data is done by looking at the correlation among the question items. The test results at Table 2 show that HC5 and KS 5 items are invalid, so both items are dropped from further testing. After that, testing the validity of the measurement model with Confirmatory Factor Analysis (CFA) was conducted. The first test obtained a value of  $\chi^2$  is 676,441, Comparative Fit Index (CFI) of 0.867, and root mean square error of approximation (RMSEA) of 0.103. The results of this test indicate that the data is not good; this is also evident from the loading factor value of HC1 and HC2, which is still below 0.5. To fulfill the requirements, we also remove outlier data. After the question items that have a loading factor below 0.5 are removed, the CFA test results show a value of  $\chi^2$  is 294.74; CFI of 0.93, and RMSEA of 0.08. The Composite Reliability (CR) values of all variables are above 0.8, as required [65], while the Average Variance Extracted (AVE) values of all variables are above 0.5 as recommended. Based on the results of the CFA test, it can be concluded that the measurement variables are valid and reliable so that the next testing phase can be done.

**Table 2.** CFA Test Results.

Constructs and Item	Factors Loading	AVE	CR
Innovations (INO)		0.533	0.887
INO1 How often do companies introduce innovative products/services to customers?	0.617		
INO2 How often do companies teach methods of product processing innovation to employees?	0.78		
INO3 How often does the company make organizational innovations/changes?	0.714		
INO4 How often do companies make changes in product packaging innovation design?	0.731		
INO5 How often do companies make innovations in marketing?	0.695		
Human capital (HC)		0.536	0.893
HC1 My company provides funds for training	0.449		
HC2 How often does the company provide training for employees	0.476		
HC3 The skills of my employees in carrying out work	0.875		
HC4 How big is employees' loyalty to the company?	0.905		
HC6 How big is employees' motivation at work?	0.815		
Knowledge Sharing (KS)		0.547	0.890
KS1 How often do you share knowledge through social media?	0.843		
KS2 How often do you spend time contributing to knowledge-sharing activities on social media?	0.876		
KS4 How often do you talk about anything on social media	0.738		
KS5 How often do you get new knowledge from the results of discussions through social media?	0.706		
Social Media Networking (SMN)		0.636	0.925
SMN1 How many business relations are connected through social media?	0.756		
SMN2 How often do companies establish communication with business partners through social media?	0.801		
SMN3 How often do companies exchange information in relations on product development through social media?	0.819		
SMN4 How often does a company's collogue contribute to business decision-making through social media?	0.722		

Note: INO: Innovation; HC: Human Capital; KS: Knowledge Sharing; SMN: Social Media Networking.

Table 3 shows the descriptive statistics, namely the minimum, maximum, average, and standard deviation scores of each variable in this study. The average scores for the human capital, knowledge sharing, social media networking, and innovation variables were 15.21; 14.49; 13.79, and 15.33, all falling into the high category. This shows that young entrepreneurs have high human capital, knowledge sharing, social media networking, and innovation.

**Table 3.** Descriptive statistics and correlation matrix.

	Min	Max	Mean	SD	1	2	3	4
1. Human Capital (HC)	5	25	15.21	4.705				
2. Knowledge sharing (KS)	4	20	14.49	3.512	0.339 **			
3. Social media networking (SMN)	4	20	13.79	3.455	0.435 **	0.618 **		
4. Innovation (INO)	5	25	15.33	4.121	0.498 **	0.519 **	0.587 **	

Note: correlation  $\geq 0.22$  or  $< -0.22$  is significant at the 0.01 level, \*\*  $p < 0.01$ .



### 3.2. Path Analysis Result

Figure 2 and Table 4 present the results of hypothesis testing using path analysis. H1–H3 predicts human capital’s positive influence on knowledge sharing, social media networking, and innovation, respectively. The results from Table 4 support H1, which states that HC has a positive effect on KS ( $\beta = 0.184, p < 0.01$ ). Meanwhile, H2 test results show which states HC affects SMN, is supported ( $\beta = 0.330; p < 0.01$ ). Human capital has a significant positive effect on innovation ( $\beta = 0.314; p < 0.01$ ). Based on these results, the H3 is supported. The result also showed that social media networking has a significant positive effect on innovation ( $\beta = 0.402; p < 0.01$ ), so hypothesis H4 was supported. Knowledge sharing also has a significant positive effect on innovation ( $\beta = 0.346; p < 0.01$ ). These results confirm that H5 is supported.

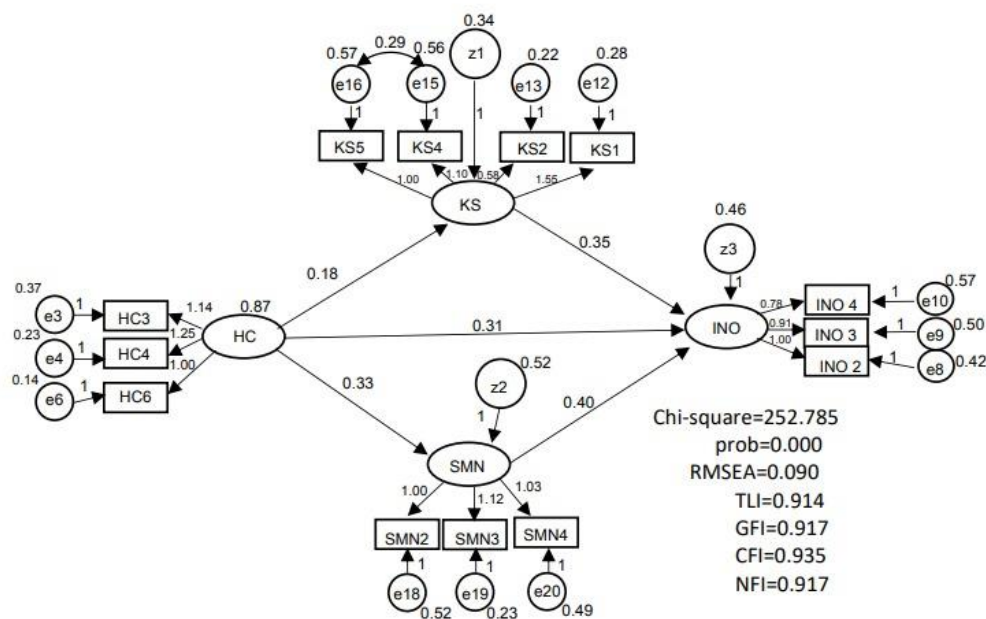


Figure 2. Full Structural Model.

Table 4. Path Analysis Test Results.

			Estimate	S.E.	C.R.	p	Hypothesis
KS	←	HC	0.184	0.037	4.964	***	H1
SMN	←	HC	0.330	0.049	6.788	***	H2
INO	←	KS	0.346	0.080	4.328	***	H5
INO	←	SMN	0.402	0.067	5.966	***	H4
INO	←	HC	0.314	0.056	5.632	***	H3
Fit index		Recommended level of fit					Model
$\chi^2/df$		<3.00					252,785
Probability		>0.05					0.000
RMSEA		<0.08					0.090
CFI		>0.90					0.935
GFI		>0.90					0.917
TLI		>0.90					0.914
NFI		~1.00					0.917

Abbreviations: HC: Human Capital; KS: Knowledge Sharing; SMN: Social Media Networking; INO: Innovation; GFI: Good Fit Index; TLI: Tucker Lewis Index; CFI: Comparative Fit Index; NFI: Normed Fit Index; RMSEA: Root Mean Square Error of Approximation. \*\*\*  $p < 0.01$ .

This study examined the mediation effect using the AMOS user-defined estimation and with a bootstrap of 5000 samples at a 95% confidence level. Based on the test results in

Table 5 shows that the specific indirect effect of HC on INO through KS (H6) is supported ( $\beta = 0.064$ ;  $p < 0.01$ ) Lower/Upper (0.025; 0.121). This shows that there is a mediating effect of HC on INO through KS. Likewise, the indirect test results of HC against INO through SMN (H7) are also supported  $\beta = 0.126$ ;  $p < 0.01$ ) Lower/Upper (0.066; 0.211).

**Table 5.** The specific and indirect effect.

Path	Indirect Effect	Lower	Upper	Probability	Hypothesis	Result
HC→KS→INO	0.064	0.025	0.121	0.001	H6	Partial Mediation
HC→SMN→INO	0.126	0.066	0.211	0.001	H7	Partial Mediation

Source: AMOS 25.

#### 4. Discussion

##### 4.1. The Direct Effect of Human Capital, Knowledge Sharing, and Social Media Networking on Open Innovation

The results of this study support hypotheses 1, 2, 3, 4 and 5 which examine the direct effect of human capital, knowledge sharing and social media networking on innovation. This indicates that the higher human capital quality, the higher innovation of SMEs owned by young entrepreneurs. This study supports the results of the study by De Winne and Sels [26], which concludes the positive effect of human capital on innovation. With the higher knowledge, skills, experience, and motivation of employees, it will be easier for SMEs owned by young entrepreneurs to foster creativity to produce innovation. The relationship between human capital and innovation can be seen from the perspective of the theory of resource-based view which states that organizations should develop organizational resources that are unique or rare, and cannot be imitated so that it becomes a valuable source of competitive advantage. The knowledge possessed by these employees is in accordance with these conditions [66]. Through heterogeneous employee knowledge, SMEs can export a variety of both tacit knowledge and explicit knowledge in order to develop open innovation. The result of the study also supports the previous study who find the positive effect of human capital to open innovation [17,23]. Young entrepreneur has better literacy on the digital world; therefore, they use this knowledge to explore more on the innovation. A study by Hervas-Oliver [22] shows the importance of technology to support the open innovation. Further, open innovation positively affects the firm performance [17].

This study also empirically proves that the higher utility of social media networking, the higher the innovation will be. The results of this study are consistent with findings by Hsu [55] and Papa, Santoro [56], which state that social media networking has a positive effect on innovation. The influence of social media improves the open innovation to support the previous hypothesis [58,59]. This indicates that social media networking is a way for SMEs to communicate, share information, and knowledge both within the organization and outside the organization so that it can come up with innovative ideas.

The results of this study also indicate that the higher knowledge sharing, the innovation will increase. This result support the Seidler-de Alwis and Hartmann [61] findings. The knowledge of the employee is meaningless if it is buried within the employee and is not shared or poured into the progress of SMEs. Knowledge sharing provides opportunities for employees to combine ideas, views, facts, information as the main capital in creating new knowledge and innovation [36].

##### 4.2. The Role of Social Media Networking and Knowledge Sharing in Mediating the Influence of Human Capital on Open Innovation

One important finding in this paper is a confirmation that social media networking has a partial role in mediating the effect of human capital on innovation. This indicates that young entrepreneurs use social networking sites to exchange information on various

matters, including business interests. More specifically, social media can be used to establish networks with external parties such as customers, business partners, and customers so that they can absorb knowledge. Human capital with high knowledge and skills will be wise in using social media networking to stimulate the creation of innovation through socialization, externalization, and the combination process [55].

Human capital in SME is the knowledge and skills inherent in individual employees/owners (entrepreneurs) that brought into the organization. Knowledge basically consists of tacit and explicit knowledge. SMEs will not be able to create knowledge without individuals, so human capital is an important element in creating knowledge and innovation. Innovation can be created if there is an elaboration of various kinds of knowledge, so knowledge sharing is needed. Tacit knowledge that exists in employees and owners (entrepreneurs) will have no meaning if it is still hidden. Through knowledge sharing, tacit knowledge among heterogeneous employees enables SMEs to collaborate into new knowledge in order to create an innovation.

## 5. Conclusions

This study aims at examining the effect of human capital on innovation. Furthermore, the current study considers the role of knowledge sharing and social media networking as the mediating variable in the relationship between human capital and innovation. The results of our study show that human capital improves the innovation performance of a company. Additionally, the study also finds that both social media networking and knowledge sharing have a significant role in mediating the relationship between human capital and innovation. Both social media networking and knowledge sharing partially mediate the influence of human capital on innovation. The results of the study also contribute to understanding the role of human capital in innovation. It is important to consider the other variable such as social media networks and knowledge sharing on the relationship between human capital and innovation.

This study has several important implications for practitioners (young entrepreneurs), including (1) considering the importance of human capital in creating innovations to win the competition, young entrepreneurs need to develop their human capital through various training. Thus, the limitations in the number of human resources can be circumvented by increasing the quality of human capital. (2) Young entrepreneurs and their employees can use social media networking to absorb new information and knowledge from the external environment. In addition, SMEs can also receive various inputs from partners, customers, suppliers, and business partners through social media. Moreover, young people are very familiar with the use of social media. Therefore, young entrepreneurs can use it for the progress of SMEs, namely to improve innovation. (3) Young entrepreneurs need to consider various training and motivate employees to overcome their resistance so that they will have the willingness to share knowledge. In addition to practical implications, this study also offers theoretical implications. In the last few decades, there have been many studies that examine determinant innovations in SMEs). However, very little study links human capital to innovation, especially the role of social media networking mediation and knowledge sharing on the effect of human capital on innovation. Thus, from a theoretical point of view, the results of this study provide a better understanding of how social media networking can mediate the influence of human capital on innovation.

The current study also has implications for managers regarding the relationship between human capital and innovation. It is suggested that managers pay more attention to human capital. The better quality of human capital leads a company to achieve better innovation performance. It is expected that leads a company to better performance. Further, it is important to consider exploring social media networking to support the company to achieve better performance. Companies have the option to provide social media platforms to build a closer relationship with their customers. The role of knowledge sharing is also important for a company to have better innovation performance.

This study has several limitations. (1) Respondents in this study are limited to young entrepreneurs who are members of the university business incubator, so they do not include all young entrepreneurs outside the university. This condition leads the data to tend to be homogeneous in age and education, followed by training by young entrepreneurs. The results might be different if the study includes different respondents from various circles. Future study is expected to include young entrepreneur respondents from various circles so that the data obtained is more heterogeneous. (2) There are no control variables to mitigate its cross-sectional design. It is expected for future research to use control variables in mitigating cross-sectional designs. (3) This study cannot prove the mediating role of knowledge sharing in the effect of human capital on innovation. This study did not test the mediation of two variables at the same time (knowledge sharing and social media networking) simultaneously. The possibility of knowledge sharing requires a means, which is social media networking, in mediating the effect of human capital on innovation. Thus, the future study can examine the mediating role of social media networking and knowledge sharing at the same time.

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