The Effect of Green Intellectual Capital on SMEs' Business Sustainability

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Abstract:

This study aims to examine the effect of the dimensions of green intellectual capital, i.e. green human capital, green structural capital, and green relational capital, on SMEs' business sustainability. The data of this quantitative research was collected from a survey of 100 respondents and analyzed by using partial least squares. This study shows that green human capital and green structural capital have no significant effect on SMEs' business sustainability and that green relational capital influences the sustainability of SMEs' business. The findings enrich the abundance of knowledge concerning green intellectual capital, especially in the context of SMEs, and prove that green intellectual practices in the SMEs sector are still relatively low. They also imply that SMEs actors should pay more attention to the relational aspect as a relationship with stakeholders is the primary source of strength to win the competition.

Keywords green intellectual capital; business sustainability; SMEs

JEL Classification: M13; M14; M40

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Research Background

The industrial revolution has increased production and made the process even more efficient. However, the industrial revolution has also harmed the environment, including extensive energy use, resource depletion, and pollution (Bohdanowicz et al., 2001). Environmental damage has occurred, and it is estimated that 60% of ecosystems worldwide have been degraded (Gong et al., 2018). If nothing is done to address this, environmental problems will continue to escalate and may only get worse.

In the last ten years, this excessive activity in the industry which has also given rise to environmental problems has attracted the attention of professionals to initiate "green" actions in organizations. One of the efforts made is through the management of intellectual capital, including knowledge concerning environmental management, hereafter referred to as green intellectual capital (Sudibyo & Sutanto, 2020). In the era of a knowledge-based economy, intellectual capital has become much more important than financial capital. Increasing the recognition and utilization of intellectual capital will help improve the company's financial performance, so this will also affect the sustainability of the organization (Daat, 2019).

Green intellectual capital is measured by three determinants: green human capital, green structural capital, and green relational capital. Green intellectual capital is defined as the ability, knowledge, creativity, awareness, and commitment of business actors to environmental management (Chen, 2007). Liu (2010) described GIC as the combination of capability and green knowledge of organizations to enhance competitive advantage.

The term "sustainable" was first used to address the destruction of the natural environment and its negative impact on human health, social welfare, and economic growth (Yusoff et al., 2019). The definition from the World Commission on Environment and Development (1987) shows that sustainability is the development that meets the needs of the present generation without compromising on the loss of the ability of future generations to meet their own needs, which is common and widely used in the literature can be applied to three combined outcomes namely economic, social and environmental.

Organizational motivation in realizing the importance of intellectual capital underlies the potential to improve environmental performance. In addition, sound environmental management will also strengthen the image of an organization that is responsive, adaptive, and responsible, and supports the organization's sustainability. Commitment to getting a better organizational reputation motivates a green culture in the organization, one of which is good environmental management to encourage increased performance (Linnenluecke & Griffiths, 2010). Previous literature has shown the relationship between IC and various organization's performance. Chen (2008) who introduced the GIC concept stated that GIC can constantly enhance the competitive advantage of the organization. Mårtensson and Westerberg (2016) emphasized how the organization develops its internal capabilities through the fundamental aspects of environmental strategy. Furthermore, The NRBV theory suggests that the strategy and competitive advantage in the future will be rooted in abilities that encourage an environmentally sustainable economy (Hart, 1995). Meanwhile, the Intellectual Capital Based View (ICBV) specifically focuses on the knowledge asset in organizations (Yound and Snell, 2004)

The theory used in this study is the Natural Resource-Based View (NRBV) by Hart (1995) and the Intellectual Capital-based View (ICBV) theory (Reed et al., 2006). Hart, (1995) states that environmental resources and capabilities are needed to attain a competitive advantage now and in the future. On the other hand, RBV, according to Hart (1995), ignores the relationship between the natural environment and the organization. Meanwhile, ICBV focuses more on intangible resources or intellectual measurements and further categorizes them into three classifications, specifically human capital, structural capital, and relational capital. The current research tries to connect these two theories by creating a concept of intangible resources that leads to business sustainability by assimilating "green" into conventional intellectual capital, which is then called green intellectual capital (Yusoff et al., 2019).

World Commission on Environment and Development (1987) defines sustainability as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability aims to secure intergenerational justice. The same logic applies to business. Business owners require their business to be as profitable as it was in the past and, ideally, grow. Based on this logic, business sustainability can be defined as the ability of companies to acknowledge their short-term financial needs without compromising their ability (or others) to meet their future needs (Bansal & DesJardine, 2014).

Green Intellectual Capital incorporates environmental concepts into Intellectual Capital (IC) to compensate for the previous inadequacy of ecological issues. Green Intellectual Capital reflects the company's intangible assets, including knowledge, wisdom, experience, and innovation in the area of environmental protection (Chen,

2007). The GIC dimension consists of Green Human Capital, Green Structural Capital, and Green Relationship Capital. Green Human Capital is the final presentation of knowledge, skills, abilities, experience, behavior, wisdom, creativity, and employee commitment to the environment or green innovation. Meanwhile, Green Structural Capital is defined as a reserve of organizational capability, organizational commitment, knowledge management system, managerial philosophy, organizational culture, corporate image, patents, copyrights, and trademarks for environmental protection or green innovation. Finally, Green Relationship Capital is a reserve of the company's interactive relationships with customers, suppliers, network members, and partners for environmental management and green innovation (Chang & Chen, 2012)

Intellectual capital is the result of knowledge-based asset management that can add value to an organization (Santos-Rodrigues et al., 2013). Human capital as one of the dimensions of intellectual capital is the key to an organization because the knowledge and skills of employees are important elements that can make an organization achieve sustainability (Subramaniam & Youndt, 2005). The environment is an important aspect of the company, therefore the relationship between Green human capital and business sustainability is important to study. Huang & Kung (2011) reveal that Green Intellectual Capital helps organizations meet stringent international environmental regulations, create value for organizations, and meet high customer demands on environmental issues. Yusoff et al. (2019) also found the connection between the two. Thus, the research hypothesis is green human capital affects business sustainability.

Structural Capital consists of knowledge that is translated into a database, programs, and organizational systems (Edvinsson & Malone, 1997), which can support organizational productivity and performance (Bontis, 1998). If without structural capital, intellectual capital is only human capital (Mehralian et al., 2013). Organizations that are equipped with a strong structure will increase their performance (Kamaluddin & Kasim, 2013). Akhtar et al. (2015) stated that structural capital is important to achieve business sustainability. Organizations must have good structural capital in relation to the climate change we are all facing (Yusoff et al., 2019). Thus, the second hypothesis is green structural capital affects business sustainability.

Relational capital includes relationships and knowledge of consumer preferences (Yitmen, 2011). Good relationships with consumers and stakeholders will improve organizational performance and competitive advantage (Johnson, 1999). Close cooperation with other organizations can be a starting point for achieving goals (Bicknell & McManus, 2006; Kuo et al., 2015). Niesten et al. (2016) noted that the relationship between organizations, governments, and other institutions, will result in a sustainable society. Dickel et al. (2018) added that stable green environmental collaboration will increase environmental awareness among partners which in turn leads to decreased environmental uncertainty. The positive influence between Green relational capital and business sustainability is proven by Yusoff et al. (2019) dan Akhtar et al. (2015) which states that relational capital is an important element of sustainability. Thus, the last hypothesis is green relational capital affects business sustainability.

The impacts of environmental protection on sustainability were not paid much attention to by academic researchers. Whereas the trends of the strict international environmental regulations changed the patterns of competition around the world (Chen, 2007). Numerous scholars had paid attention to intellectual capital, but none explored intellectual capital about green innovation or environmental management. Therefore, this study wanted to fill this research gap, and proposed a construct of green intellectual capital and explore the relationship between intellectual capital and sustainability.

SMEs are the backbone of the Indonesian economy. Until 2018, there were 64.19 million SME actors, contributing to GDP (Gross Domestic Product) of 61 percent and a contribution to employment of 96.84 percent. With the significant role of SMEs in supporting the Indonesian economy, it is essential to research the contribution of each dimension of green intellectual capital to the business sustainability of SMEs. This research intends to investigate the effect of independent variables on the determined dependent variable and see how significant the green intellectual capital variables are, mainly green human capital, green structural capital, and green relational capital, with the business sustainability of SMEs in Indonesia.

Research Method

This study use a quantitative research approach. The variables applied to measure the dimensions of green intellectual capital, particularly green human capital, green structural capital, and green relational capital and business sustainability, have been used previously to increase the validity and reliability of the measurement.

Each variable was measured using a Likert scale of 1 to 7. The variables utilized in this study to verify the hypotheses mentioned above include the dependent variable, specifically business sustainability, and independent variable, i.e., green human capital, green structural capital, and green relational capital.

The target population of this research is SMEs in East Java. The sample selection was determined using the purposive sampling method to achieve certain limitations or objectives expected in the study. The following criteria decided the population and sample of this study: (1) SMEs in the manufacturing sector in East Java (2) SMEs returned the questionnaire and had complete data required in this study. The type of data in this study is to use primary data or data obtained directly from the source. The data collection method used in this study is a survey method using a questionnaire instrument (questionnaire). n this study, the respondents in question are SMEs actors in Indonesia. The hypothesis testing use Partial Least Square (PLS) analysis.

Result

This study takes the object of SMEs, which is engaged in the manufacturing industry in East Java Province, which has ± 3,447,520 SMEs registered with the cooperatives and SMEs Office of East Java Province in 2021. This number has the potential to increase every year. The criteria for SMEs in Indonesia based on Law No. 20 of 2008 is a business unit with a maximum net asset of IDR 10 billion. Data was obtained by distributing questionnaires online and offline. The total number of questionnaires distributed was 500 questionnaires to achieve a minimum of 341 samples (Krejcie & Morgan, 1970), to SMEs owners, which were carried out for four months. To facilitate data entry, we visited several SMEs directly. Of the 500 questionnaires distributed, the total responses were 114 respondents from different SMEs. However, 14 SMEs did not fill out questionnaires completely, so they could not be processed further. Consequently, there are 100 questionnaires with a response rate of 20% for the final analysis. This response rate is acceptable following the statement of Sekaran & Bougie (2010) that the ideal response rate is between 5% to 35% for social science studies

Respondents in this study are individuals or groups who are micro, small, and medium enterprises in the manufacturing sector registered with the Department of Cooperatives and SMEs of East Java Province. The following is a description of the respondents: 61% of owners/decision-makers in SMEs are male and 39% female. A total of 38% of SMEs have net assets of less than Rp 50 million, 46% have net assets between Rp 50 million to 500 million, and 16% with total net assets between Rp 500 million to Rp 10 billion. A total of 41 entities (41%) has been operating for more than 20 years, 35 entities have been using for a period of 16-20 years, 17 (17%) entities have performed in 11-15 years, and 7 entities have been operating in 5-10 years.

The hypothesis testing model used in this study is PLS analysis. Hypothesis testing will be carried out by determining a significance level of 5% or 0.05 and then comparing the t-statistic value with the t-table. If the t-statistic value is greater than the t-table value, then the hypothesis is accepted. Vice versa, if the t-statistic value is smaller than the t-table value, then the hypothesis is rejected.

There are 2 (two) tests in the outer model, specifically, validity and reliability used to determine the instrument's ability to define a construct. Testing the validity of this research is done by testing the validity of the convergent and discriminant validity. The parameters used in conducting the convergent validity test are the loading factor value of more than 0.7 and the AVE value of more than 0.5. Table 1 are the results of the convergent validity test.

Table 1. Convergent Validity Test Results Using Outer Loading

	GHC	GSC	GRC	BS	Loading Value Interpretation
GHC1	0,819				
GHC2	0,868				
GCH3	0,875				
GCH4	0,806				
GSC1		0,895			
GSC2		0,754			
GSC3		0,807			All indicators have a loading value > 0.5, meaning that the indicators in this study meet convergent validity
GSC4		0,867			
GSC5		0,922			
GSC6		0,922			
GSC7		0,906			
GSC8		0,888			
GRC1			0,865		
GRC2			0,891		

	GHC	GSC	GRC	BS	Loading Value Interpretation
GRC3			0,833		
GRC4			0,864		
BS1				0,789	
BS2				0,846	
BS3				0,881	
BS4				0,917	
BS5				0,823	
BS6				0,906	
BS7				0,875	
BS8				0,873	
BS9				0,846	
BS10				0,857	
BS11				0,889	
BS12				0,883	
BS13				0,717	
BS14				0,824	

Source : Data Processed (2021)

The discriminant validity test was measured by comparing the AVE roots for each construct with the correlation between the constructs and other constructs. The AVE root value must be more than the correlation of the latent variables. In addition, the discriminant validity test is also measured by the cross-loading value, which requires it to have a value of more than 0.7.

Table 2. Cross Loading Value

	GHC	GSC	GRC	BS	Cross Loading Interpretation
GHC1	0,819				
GHC2	0,868				
GCH3	0,875				
GCH4	0,806				
GSC1		0,895			
GSC2		0,754			The cross-loading value of each indicator is more significant than 0.7, meaning that all indicators meet discriminant validity
GSC3		0,807			
GSC4		0,867			
GSC5		0,922			
GSC6		0,922			
GSC7		0,906			
GSC8		0,888			
GRC1			0,865		
GRC2			0,891		
GRC3			0,833		
GRC4			0,864		
BS1				0,789	
BS2				0,846	
BS3				0,881	
BS4				0,917	
BS5				0,823	
BS6				0,906	
BS7				0,875	
BS8				0,873	
BS9				0,846	
BS10				0,857	
BS11				0,889	
BS12				0,883	
BS13				0,717	

	GHC	GSC	GRC	BS	Cross *Loading Interpretation*
BS14				0,824	

Source : Data Processed (2021)

The reliability test is carried out by looking at the value of Cronbach's alpha which must have a value of more than 0.6 and composite reliability of more than 0.7.

Table 3. Value of Composite Reliability and Cronbach's Alpha

	Composite Reliability	Cronbach's Alpha	Interpretation
BS	0,974	0,728	Cronbach's alpha value for all constructs is
GHC	0,907	0,710	greater than 0.6, meaning that it has met
GSC	0,962	0,760	the reliability test
GRC	0,929	0,767	

Source : Data Processed (2021)

Table 3 shows that all the constructs used have a Cronbach's alpha value of more than 0.6 and composite reliability of more than 0.7 so it can be concluded that all the constructs used have met the reliability test requirements. After testing the validity and reliability tests, it can be concluded that overall, the measurement instruments and questionnaires are valid and reliable so that the questionnaire can be used for testing. The structural model (inner model) is a model that describes the relationship between latent variables that is evaluated using the value or goodness of fit index (Tenenhaus et al. 2004). The goodness of fit (GoF) test shows that the GoF value of 0.823 indicates that the research model can be categorized as a good model.

Table 4. Goodness of Fit Index

	AVE	R2		Interpretation
BS	0,728	0,915		
GHC	0,710			
GSC	0,767			The GoF value of 0.823 indicates
GRC	0,760			that the research model can be
Average score	0,741	0,915		categorized as a good model
AVE x R2			0,678	
GoF = $\sum\sqrt{AVE \times R^2}$			0,823	

Source : Data Processed (2021)

The path coefficient value and the t-statistic value indicate the direction of the variable relationship and indicate the level of significance in hypothesis testing. The path coefficient value is in the range of values of -1 to 1. When the path coefficient value is positive, the direction of the relationship between these variables is positive, or the hypothesis is accepted, and vice versa. When the path coefficient value has a negative value, the relationship between these variables is negative, or the hypothesis is rejected. As for the t-statistic, the two-tailed hypothesis must have a value above 1.96 with hypothesis testing at an alpha of 10 percent. If the t-statistic value is greater than the t-table value, namely 1.96, and the p-values are less than 0.10, then the relationship between variables can be said to be significant, and vice versa. If the t-statistic value is smaller than the t-table value of 1.96 and the p-values are more than 0.10, then the relationship between the variables is not significant even though the value is positive. The results of the path coefficients and t-statistic values obtained through bootstrapping are as follows:

Table 5. Hypothesis Testing Results

	T-*Statistics*	P Values
GHC -> BS	0,913	0,847
GSC -> BS	1,198	0,232
GRC -> BS	8,874	0,000**

**= significant at the 1% level

Source : Data Processed (2021)

Table 5 shows that two variables indicate the hypothesis is not significant because it has p-values more than 0.10, while one other variable indicates a significant hypothesis because it has p-values less than 0.10.

Therefore, it can be seen that the first and second hypotheses are not supported, while the third hypothesis is supported.

Discussion

The Effect of Green Human Capital on SME's Business Sustainability

The results of testing the first hypothesis prove that there is an insignificant effect between GHC and BS. Various factors can influence this result. Knowledge, skills, abilities, experience, attitudes, wisdom, ideas, creativity, commitments, and others related to environmental protection or green innovation can help companies gain a competitive advantage (Chen, 2007). However, it was found through most of the previous studies that SMEs lacked resources and had a low interest in environmental management (Yacob & Moorthy, 2012). Therefore, it becomes difficult for SMEs to see the relationship between environmental management systems and their benefits (Weerasiri et al., 2012).

The insignificant effect between GHC and BS found in this study could be due to several reasons. Most of the previous research highlighted that SMEs lacked resources and had a low interest in environmental management (Yacob & Moorthy, 2012). Therefore, SMEs cannot see the relationship between environmental management systems and their benefits (Weerasiri et al., 2012). Furthermore, most organizations, especially SMEs, tend to ignore the concept of GHC and do not fully pay attention to environmental aspects in their human resources (Yusoff et al., 2019). Human capital is an essential resource with a significant contribution to the sustainability of capabilities (Karchegani et al., 2013).

The results of this study are in line with Yusoff et al. (2019), who also stated that SMEs does not equip its human resources with adequate training to improve skills and competencies, especially in the current era of knowledge. This training program is needed to instill environmental knowledge into the organization to take advantage of opportunities in the business market and meet customer demands. The results of this study are also in line with research conducted by Tambunan (2008), which claims about several problems that occur in SMEs in Indonesia, one of which is the lack of attention to aspects of human resources working capital, management, and skills. In this case, SMEs has employees who are not ready and lack knowledge and experience related to environmental aspects. They are not equipped with adequate training to improve skills and competencies, especially in today's knowledge era. This training program is necessary to instill environmental knowledge in human resources to take advantage of opportunities in the business market and meet customer demands. However, SMEs rarely develop training programs for their jobs as well as owners (Jones & Asensio, 2001; Richbell et al., 2010). SMEs are usually unaware of their human resource problems (Richbell et al., 2010).

The Effect of Green Structural Capital on SME's Business Sustainability

The results of testing the second hypothesis prove that there is an insignificant effect between GSC and BS. Chen (2007) defines GSC as a stock of organizational capabilities, organizational commitment, knowledge management systems, reward systems, information technology, databases, managerial mechanisms, operating processes, managerial philosophy, organizational culture, corporate image, patents, and trademarks, and so on. they are relating to the environment, environmental protection or green innovation in an organization. However, the results of research and data in this study found that GSC was the least implemented among the three types of GIC in manufacturing SMEs in East Java. As evidenced by the results of data processing, it was found that the second independent variable in this study, namely GSC, produced an average value (mean) of disclosure of 9.34 or 9.34% and a standard deviation of 5.61%. This result reflects that only 9.34% of the organizations in this study have an adequate environmental management system. The results of this study are in line with the research of Josephine et al. (2020), which examined GIC in manufacturing companies listed on the IDX. Compared to large companies, small companies are constrained by the lack of resources to invest in technology or human resource capabilities to anticipate ecological impacts (Bigliardi & Galati, 2016; Healy et al., 2015). Manufacturing SMEs considers change as optional and expensive (Despeisse et al., 2013). These findings do not mean that companies can ignore GSC, but companies are expected to invest and build a robust environmental management system to maintain their intellectual capital.

The Effect of Green Relational Capital on SME's Business Sustainability

The results of hypothesis testing found that GRC had a positive effect on BS. The findings of this study are in line with many previous studies (Chen, 2007; Erinos & Yurniwati, 2018; Firmansyah & Hartanto, 2019; Yong et al., 2019), which found significant contributions of GRC to various business performances. Furthermore, (Yusoff et al., 2019) found a relationship between GIC and business sustainability. If the company can run its business by considering the community's environmental, social, and economic conditions, this will signal stakeholders to increase their trust and dependence on the company. Relational capital is defined as a combination of levels of understanding, trust, relationships, and collaboration among alliance partners, suppliers, and channels (Capello & Faggian, 2005). Furthermore, GRC is an interactive relationship with customers, suppliers, network members, and partners about the company's environmental management and green innovation, which enables it to create wealth and gain a competitive advantage (Chen, 2007).

This study indicates that the relationship between SMEs and their stakeholders is based on knowledge sharing and collaboration. It is believed that the development of the GRC should be supported channelled through a collaborative approach. This approach motivates SMEs to adopt BS practices, especially if the GRC involves a willingness to share ideas about BS practices and the benefits of these practices. In addition, SMEs can use the GRC to create a joint dialogue with stakeholders to reduce environmental impacts and produce environmentally friendly products, thus leading to increased sustainability.

Conclusion

There is an urgent need to adopt green strategies such as GIC to solve environmental problems. The advantages of adopting GIC have been recognized by past researchers such as (Chang & Chen, 2012; Chen, 2007; Huang & Kung, 2011). The empirical results of this study indicate that of the three types of GIC, only Green Relational capital has a positive correlation with sustainability. Building good relationships with consumers, suppliers, and other work partners (stakeholders) is essential for the company to do. This can be the company's primary source of strength to win the competition in the business world.

This study has several limitations, including that the study was conducted in East Java, Indonesia, a developing country with an organizational character that cannot generalize to other countries or regions. Second, this study uses questionnaire data. Other approaches such as interviews are needed to provide meaningful insight into changes in GIC components over time and the reasons behind the poor implementation of other aspects of GIC in organizations. Furthermore, the sample size of this study was too small, even though the response rate was 20%. Some suggestions for further research are to try to research EKM in other developing sectors such as IT and conduct research using an interview approach in order to provide a more in-depth description of GIC.

References

Akhtar, C., Ismail, K., Ndaliman, M., Hussain, J., & Haider, M. (2015). Can Intellectual Capital of SMEs Help in Their Sustainability Efforts. *Journal of Management Research*, 7, 82–97. https://doi.org/10.5296/jmr.v7i2

Bansal, P., & DesJardine, M. R. (2014). Business sustainability: It is about time. *Strategic Organization*, *12*(1), 70–78. https://doi.org/10.1177/1476127013520265

Bicknell, S., & McManus, P. (2006). The Canary in the Coalmine: Australian Ski Resorts and their Response to Climate Change. *Geographical Research*, *44*, 386–400. https://doi.org/10.1111/j.1745-5871.2006.00409.x

Bigliardi, B., & Galati, F. (2016). Which factors hinder the adoption of open innovation in SMEs? *Technology Analysis & Strategic Management*, *28*(8), 869–885. https://doi.org/10.1080/09537325.2016.1180353

Bohdanowicz, P., Churie-Kallhauge, A., Martinac, I., & Rezachek, D. (2001). *Energy-efficiency and conservation in hotels–towards sustainable tourism*. 1–12.

Bontis, N. (1998). Intellectual capital: An exploratory study that develops measures and models. *Management Decision*, *36*(2), 63–76. https://doi.org/10.1108/00251749810204142

Capello, R., & Faggian, A. (2005). Collective Learning and Relational Capital in Local Innovation Processes. *Regional Studies*, *39*(1), 75–87. https://doi.org/10.1080/0034340052000320851

Chang, C., & Chen, Y. (2012). The determinants of green intellectual capital. *Management Decision*, *50*(1), 74–94. https://doi.org/10.1108/00251741211194886

Chen, Y.-S. (2007). The Positive Effect of Green Intellectual Capital on Competitive Advantages of Firms. *Journal of Business Ethics*, *77*(3), 271–286. https://doi.org/10.1007/s10551-006-9349-1

Daat, S. C. (2019). Pengaruh Pengungkapan Relational Capital Pada Kinerja Keuangan Perusahaan (Studi Empiris Pada Perusahaan High-Ic Intensive Industries Yang Terdaftar Di Bursa Efek Indonesia). *Nominal: Barometer Riset Akuntansi dan Manajemen*, *8*(2), 255–273. https://doi.org/10.21831/nominal.v8i2.26702

Despeisse, M., Oates, M., & Ball, P. (2013). Sustainable manufacturing tactics and cross-functional factory modelling. *Journal of Cleaner Production*, *42*, 31–41. https://doi.org/10.1016/j.jclepro.2012.11.008

Dickel, P., Hörisch, J., & Ritter, T. (2018). Networking for the environment: The impact of environmental orientation on start-ups' networking frequency and network size. *Journal of Cleaner Production*, *179*, 308–316. https://doi.org/10.1016/j.jclepro.2018.01.058

Edvinsson, L., & Malone, M. (1997). *Intellectual Capital*. Harper Business.

Erinos, N., & Yurniwati. (2018). Green Intellectual Capital and Financial Performance of Manufacturing Companies in Indonesia. *Proceedings of the First Padang International Conference On Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2018)*, 613–618. https://doi.org/10.2991/piceeba-18.2018.79

Firmansyah, A., & Hartanto, L. (2019). KAPITALISASI ASET TAK BERWUJUD YANG DIHASILKAN SECARA INTERNAL OLEH START UP COMPANY. *INFO ARTHA*, *3*(1), 29–41. https://doi.org/10.31092/jia.v3i1.497

Gong, M., Simpson, A., Koh, L., & Tan, K. H. (2018). Inside out: The interrelationships of sustainable performance metrics and its effect on business decision making: Theory and practice. *Resources, Conservation and Recycling*, *128*, 155–166. https://doi.org/10.1016/j.resconrec.2016.11.001

Hart, S. L. (1995). A Natural-Resource-Based View of the Firm. *The Academy of Management Review*, *20*(4), 986–1014. JSTOR. https://doi.org/10.2307/258963

Healy, A., Malhotra, N., & Mo, C. H. (2015). Determining false-positives requires considering the totality of evidence. *Proceedings of the National Academy of Sciences*, *112*(48), E6591. https://doi.org/10.1073/pnas.1518074112

Huang, C., & Kung, F. (2011). Environmental consciousness and intellectual capital management: Evidence from Taiwan's manufacturing industry. *Management Decision*, *49*(9), 1405–1425. https://doi.org/10.1108/00251741111173916

Johnson, W. (1999). Integrative taxonomy of intellectual capital: Measuring the stock and flow of intellectual capital components in the firm. *International Journal of Technology Management - INT J TECHNOL MANAGE*, *18*(5), 562–575. https://doi.org/10.1504/IJTM.1999.002788

Jones, C., & Asensio, M. (2001). Experiences of assessment: Using phenomenography for evaluation. *Journal of Computer Assisted Learning*, *17*(3), 314–321. https://doi.org/10.1046/j.0266-4909.2001.00186.x

Josephine, K., Ciptadi, B., & Aloysius, J. (2020). Pengaruh Green Intellectual Capital Terhadap Business Sustainability. *Jurnal Manajemen Strategi Dan Aplikasi Bisnis*, *3*(2), 117–128.

Kamaluddin, A., & Kasim, N. (2013). The Relationship between Human Resource Management and Islamic Microfinance Providers' Performance: The Mediating Role of Human Capital. *International Journal of Business and Social Science 4*(16), 52–57.

Karchegani, M. R., Sofian, S., & Amin, S. (2013). The Relationship between Intellectual Capital and Innovation. *International Journal of Business and Management Studies*, *2*, 561–581.

Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, *30*(3), 607–610. https://doi.org/10.1177/001316447003000308

Kuo, L., Yu, H., & Chang, B.-G. (2015). The signals of green governance on mitigation of climate change – evidence from Chinese firms. *International Journal of Climate Change Strategies and Management*, 7, 154–171. https://doi.org/10.1108/IJCCSM-07-2013-0083

Linnenluecke, M. K., & Griffiths, A. (2010). Corporate sustainability and organizational culture. *Journal of World Business*, *45*(4), 357–366. https://doi.org/10.1016/j.jwb.2009.08.006

Mehralian, G., Rasekh, H. R., Akhavan, P., & Ghatari, A. R. (2013). Prioritization of intellectual capital indicators in knowledge-based industries: Evidence from pharmaceutical industry. *International Journal of Information Managemen*, *33*(1), 209–216. https://doi.org/10.1016/j.ijinfomgt.2012.10.002

Niesten, E., Jolink, A., Jabbour, A., Chappin, M., & Lozano, R. (2016). Sustainable collaboration: The impact of governance and institutions on sustainable performance. *Journal of Cleaner Production*, *155*. https://doi.org/10.1016/j.jclepro.2016.12.085

Reed, K. K., Lubatkin, M., & Srinivasan, N. (2006). Proposing and Testing an Intellectual Capital-Based View of the Firm. *Journal of Management Studies*, *43*(4), 867–893. https://doi.org/10.1111/j.1467-6486.2006.00614.x

Richbell, S., Szerb, L., & Kispál-Vitai, Z. (2010). HRM in the Hungarian SME sector. *Employee Relations*, *32*, 262–280. https://doi.org/10.1108/01425451011038799

Santos-Rodrigues, H., Faria, J., Cranfield, D., & Morais, C. (2013). Intellectual Capital and Innovation: A Case Study of a Public Healthcare organisation in Europe. *The Electronic Journal of Knowledge Management*, *11*(4), 361–372.

Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill-building approach (5th ed.)*. John Wiley & Sons.

Subramaniam, M., & Youndt, M. (2005). The Influence of Intellectual Capital on the Types of Innovative Capabilities. *Academy of Management Journal*, *48*, 450–463. https://doi.org/10.5465/AMJ.2005.17407911

Sudibyo, Y. A., & Sutanto, K. A. (2020). Environmental Consciousness and Corporate Social Responsibility as Drivers of Green Intellectual Capital. *International Journal of Innovation*, *13*(4), 11.

Sugiyono, S. (2015). *Metode Penelitian Kombinasi (Mix Methods)*. Alfabeta.

Tambunan, T. (2008). SME development, economic growth, and government intervention in a developing country: The Indonesian story. *Journal of International Entrepreneurship*, *6*(4), 147–167. https://doi.org/10.1007/s10843-008-0025-7

Weerasiri, S., Zhengang, Z., & Dissanayake, R. (2012). Attitudes and Awareness towards Environmental Management and its Impact on Environmental Management Practices (EMPs) of SMEs in Sri Lanka. *Journal of Social and Development Sciences*, *3*(1), 16–23. https://doi.org/10.22610/jsds.v3i1.681

World Commission on Environment and Development. (1987). *Our common future*. Oxford University Press; /z-wcorg/.

Yacob, P., & Moorthy, M. (2012). Green Practices: Perception of Malaysian SME Owners/Managers. *International Journal of Academic Research in Economics and Management Sciences*, *1*(3), 103–111.

Yitmen, I. (2011). Intellectual Capital: A Competitive Asset for Driving Innovation In Engineering Design Firms. *Engineering Management Journal; EMJ*, *23*, 3–19. https://doi.org/10.1080/10429247.2011.11431891

Yong, J. Y., Yusliza, M.-Y., Ramayah, T., & Fawehinmi, O. (2019). Nexus between green intellectual capital and green human resource management. *Journal of Cleaner Production*, *215*, 364–374. https://doi.org/10.1016/j.jclepro.2018.12.306

Yusoff, Y. M., Omar, M. K., Kamarul Zaman, M. D., & Samad, S. (2019). Do all elements of green intellectual capital contribute toward business sustainability? Evidence from the Malaysian context using the Partial Least Squares method. *Journal of Cleaner Production*, *234*, 626–637. https://doi.org/10.1016/j.jclepro.2019.06.153