

## How does COVID-19 influence the MSME Sector in Sri Lanka?

Indika, M.G.N.<sup>1</sup>  
Perera, H.A.P.K.<sup>2</sup>  
Abesiriwardena, N.K.<sup>3</sup>

### Abstract

Micro Small and Medium Enterprise (MSME) sector is considered to be the backbone of an economy where a strong MSME sector contributes towards the economic stability and well-being of a country. More importantly, technology plays a critical role in the development of business performance as technological know-how is vital to survive amidst COVID-19 outbreak. Hence, it motivates the entrepreneurs to improve their awareness of technology and thereby to use new technology to improve the business performance. Further, it has been identified that entrepreneurial competencies are important to ensure higher business performance where most successful entrepreneurs utilize their competencies to improve business performance. Hence, the purpose of this study is to investigate the changes in technological literacy, entrepreneurial competency, and business performance amidst the COVID-19 pandemic in Sri Lanka. The study was conducted as a quantitative, cross-sectional study whilst the data was collected through a structured questionnaire from 48 entrepreneurs of micro and small enterprises. The results of the study reveal that there is a significant difference in technological literacy, business performance, and entrepreneurial competency amidst COVID-19. The level of commitment of the entrepreneurs is found to be improved significantly after the COVID-19 pandemic. However, the technological literacy is found to be less developed among micro and small entrepreneurs. Therefore, the policy

<sup>1</sup>Department of Business Economics, University of Colombo, Sri Lanka. Email: mgnindika@dbe.cmb.ac.lk

<sup>2</sup>Department of Finance, University of Colombo, Sri Lanka. Email: kasunperera@dfn.cmb.ac.lk

<sup>3</sup>Department of Business Economics, University of Colombo, Sri Lanka. Email: nipuniabesiriwardena@dbe.cmb.ac.lk

makers need to focus on developing suitable strategies to improve their technological know-how.

**Keywords:** Business performance, COVID-19, Entrepreneurial competency, Micro and Small Enterprises, Sri Lanka, Technological literacy

## **1. Introduction**

The Micro Small and Medium Enterprises (MSMEs) play a vital role in the socio-economic development of the country since a strong MSME sector contributes towards the economic stability and well-being of a country. MSME sector in Sri Lanka plays a vital role as it accounts for more than 75% of the total number of enterprises and provides 45% of employment in the country. According to the Ministry of Industry and Commerce (2017), the MSME sector contributes 52% of the Gross Domestic Production (GDP). Therefore, the MSME sector can be recognized as a driver of change for inclusive economic growth, regional development, employment generation, and poverty reduction. Currently, the Sri Lankan government has recognized that it is important to enhance the national and international competitiveness through growth and development to face the emerging challenges and develop the MSME as a thriving sector. Therefore, there is a pressing need to increase the growth of MSME by providing state-of-art technology, entrepreneur culture, and skills development (Ministry of Industry and Commerce, 2017).

Information and knowledge have become increasingly important in the contemporary globalized economy. Sri Lanka considers information communication technology (ICT) as a key tool for transforming the economy. The computer literacy rate in Sri Lanka is 30.1% (aged 5-69) which means more than one out of four persons have computer literacy whereas digital literacy is 44.3% which means more than two out of five people are digitally literate (Department of Census and Statistics of Sri Lanka, 2019). According to the National Youth Survey 2009, nearly 43% of 25-29-year-old had computer literacy (De Silva et.al., 2013) and in 2019 it has increased

to 51.5% (Department of Census and Statistics of Sri Lanka, 2019). These statistics reveal that there is a moderate level of computer and digital literacy in Sri Lanka.

Technology plays a critical role in the development of business performance. For MSMEs, technological literacy is a vital knowledge resource that helps them to expand their business operations locally and globally. Technological know-how also important to survive in the current business turmoil (Kulathunga et.al, 2020). Hence, it motivates the entrepreneurs to improve their awareness of technology and thereby to use new technology in their business operations to improve business performance.

Further, it has been identified that entrepreneurial competencies are important to ensure higher business performance where most successful entrepreneurs utilize their competencies to improve business performance and thereby introduce new entrepreneurial opportunities (Omerzel & Antoncic, 2008). Chandler and Hanks (1994) also a note the growth of a business enterprise is directly correlated with entrepreneurial competencies. Therefore, entrepreneurial competency is becoming important for entrepreneurs to proactively deal with the business environment. During the past few decades, the entrepreneurial competencies have been increased mainly due to the strategic role played by the entrepreneur of a business enterprise (Wickramaratne et.al., 2014).

With the impact of the COVID-19 pandemic, most of the economic activities of MSMEs were negatively affected and they had to undergo severe hardships. The primary challenge faced by the MSME sector is the breakdown of the supply chain due to the lockdowns and curfew. Hence, the adoption of technology for business activities has become particularly important during the COVID-19 era as it becomes one of the primary modes of contacting customers. Online marketing, online teaching and knowledge sharing, Webinars, web-based lecture programs also increased significantly. Many private sectors developing online working for their staff which can be identified as a significant change that has

taken place due to the present situation (Gunawardena, 2020). Further, it is identified that strengthening the entrepreneurial spirit, motivating entrepreneurs to grab opportunities, and planning for business resilience is crucial in retaining the business and getting back to business (Gunawardena, 2020). Further, entrepreneurs are challenged to set up their competencies in order to succeed in this pandemic situation.

At present, there are limited studies conducted to investigate the impact of COVID-19 on the business performance of the MSME sector. To the best of our knowledge, this is the first study that aims to fill the empirical gap in the MSME and COVID-19 literature by investigating how two important variables, namely, technological literacy and entrepreneurial competency, affect business performance of the MSME sector. Hence, the objective of this study is to investigate the changes in technological literacy, entrepreneurial competency, and business performance amidst the COVID-19 pandemic in Sri Lanka.

This paper contributes to the MSME literature in various ways. Firstly, this study explains how technological literacy and entrepreneurial competency influence business performance, both financial and non-financial performance. Secondly, this paper contributes to the empirical studies of the COVID-19 pandemic by identifying the differences in the impact of technological literacy, entrepreneurial competency on business performance. Thirdly, the findings of this paper could be providing the direction and a framework for future studies to extend the MSME literature.

This paper is structured as follows: section 2 provides a brief explanation of literature review and the hypothesis development. Section 3 explains the methodology used in the study. Section 4 summarizes the data analysis and results while section 5 concludes the paper.

## 2. Literature Review and Hypothesis Development

### 2.1 What are Micro, Small, and Medium Enterprises (MSMEs)?

Different countries use different definitions for MSMEs based on their level of development. According to the International Labour Organisation (ILO), the MSME sector is extensively varied among developed and developing countries while, interestingly, it further notes that the MSME sector is differentiated within a country as well. ILO further highlights that majority of the micro and small enterprises in developing countries operate in the informal sector where these businesses are typically family-owned or self-employed operations. Nevertheless, the commonly used yardsticks to categorize the business operations into micro, small, and medium are the total number of employees, annual turnover, and total investment. Accordingly, in Sri Lanka, the Ministry of Industry and Commerce categorizes the business operations based on the number of employees and an annual turnover (see Table 1).

**Table 1: Defining SMEs in Sri Lanka**

Sector	Criteria	Size		
		Micro	Small	Medium
Manufacturing Sector	Annual Turnover	Less than Rs, Mn. 15	Rs. Mn. 16 - 250	Rs. Mn. 251 - 750
	No. of Employees	Less than 10	11 - 50	51 - 300
	Annual Turnover	Less than Rs, Mn. 15	Rs. Mn. 16 - 250	Rs. Mn. 251 - 750
Service Sector	No. of Employees	Less than 10	11 - 50	51 - 200

*Source: National Policy Framework for SME Development*

#### 2.1.1 MSMEs in Sri Lanka

The MSMEs play a critical role in the Sri Lankan economy. According to Gunawardena (2020) the contribution of the MSMEs to the GDP of the country is 52%. While conducting more than 90% of the business operations in the non-agricultural sector, MSMEs account for 45% of the total employment of the country (Gunawardena,

2020)<sup>2</sup>. Highlighting the ILO's observations on MSMEs in the developing countries, based on the Economic Census 2013/2014, the Department of Census and Statistics of Sri Lanka (2017) report that 963,669 firms are established in the informal sector while providing a livelihood for more than 1.9 million persons. Further, Gunawardena (2020) shows that 75% of the MSMEs are established in the rural areas in Sri Lanka while more than 45% of the micro-level establishments are found to be unregistered. Some of the key highlights of micro and small establishments of Sri Lanka are depicted in Table 2. Hence, these statistics it overwhelmingly notes that the businesses in the micro and small sector play a significant role in the Sri Lankan economy.

**Table 2: Key Statistics**

Criterion	MSME Sector	Micro	Small
Number of establishments	1,019,681	935,736 (91.8%)	71,126 (7.0%)
Economic sector distribution			
Industry	25.6%	25.3%	28.8%
Trade	41.0%	42%	31.3%
Service	33.4%	32.7%	39.9%
Distribution of employment (Total)	3,003,119	1,338,675 (44.6%)	529,751 (17.6%)
Economic sector distribution			
Industry	100%	29.7%	14.0%
Trade	100%	68.1%	16.8%
Service	100%	44.6%	22.6%
Percentage of registered enterprises	58.0%	54.6%	89.1%
Percentage of unregistered enterprises	42.0%	45.4%	10.9%

Source: Gunawardena (2020)

## 2.2 Entrepreneurial Competencies and Business Performance

The term entrepreneurial competencies differ from one context to another so that it should be based on different approaches and

<sup>2</sup> According to the statistics published by the Department of Census and Statistics of Sri Lanka based on the Economic Census 2013/14, there are over one million business firms established in the SME sector while providing employment opportunities to approximately 2.255 million persons in the non-agricultural sector (Gunawardena, 2020).

notions of the concept of competence (Solesvik, 2012; Mitchelmore & Rowley, 2010). Hence, it is important to understand the concept of entrepreneurial competencies. According to Bird (1995), entrepreneurial competencies are owned by the individuals who attempt to transform organizations through organizing resources and opportunities. She further notes that characteristics such as specific knowledge, motives, traits, self-images, social roles, and skills which are fundamental for the inception, existence, and growth of firms account for entrepreneurial competencies. Moreover, Man et al. (2002) state the overall ability of an entrepreneur to conduct business activities successfully can be identified as entrepreneurial competencies.

Hence, the identification of entrepreneurial competencies is essentially important to ensure the successful continuation of business ventures, particularly in the context of emerging economies. This is so because Solesvik, (2012) highlights that existence and growth of business ventures in emerging economies are highly diverse from those of in developed economies. Therefore, Mitchelmore and Rowley (2010) identify the entrepreneurial competencies as a unique set of competencies relevant to the conduct of successful entrepreneurship. Accordingly, they note that demographic, psychological, and behavioral characteristics, skills, and technical know-how as essential aspects of an entrepreneur to enhance business performance.

In addition, different scholars have employed a variety of entrepreneurial competencies to measure business performance. For instance, personal background and experience such as commercial experience, history of innovation, production and marketing experience, status, entrepreneurial experience, and previous contact with venture capitalists (Tseng & Tseng, 2019; RezaeiZadeh et al., 2017; Murray, 1996), socio-economic factors such as educational attainment, previous business experience (Boldureanu et al., 2020; Khan, 2014; Basu & Goswami, 1999), intellectual abilities, social abilities and managerial skills and abilities (Popescu et al., 2020; Pansiri & Temtime, 2008; Gasse

et al., 1997) and personal qualities such as outgoing personality, approachability, leadership, self-confidence, innovativeness and the ability to engage in risk-taking (Kocherbaeva et.al., 2019; Santandreu-Mascarell et al., 2013; Man & Lau, 2005; Martin & Staines, 1994).

Moreover, Tehseen and Ramayah (2015) note that due to rarity and uniqueness, the entrepreneurial competencies are difficult to imitate by the rivals. This leads to improving the business performance. Accordingly, different scholars have employed a variety of entrepreneurial competencies to measure business success. Therefore, following Baylie and Singh (2019), this study identifies goal setting, systematic planning, and monitoring, persistence, and commitment as the main entrepreneurial competencies which claim successful business performance. Hence, it is believed that valuable skills, knowledge, and abilities possess by an entrepreneur are capable of delivering a sustainable competitive advantage over other competitors in the market. Thus, we can hypothesize the following;

*Hypothesis 1: Entrepreneurial competencies impact on business performance of micro and small enterprises.*

### **2.3 Technological Literacy and Business Performance**

Technology has become a powerful force in the world. This dynamic and complex nature of technology has created a requirement of skill and knowledge development in the use of information, tools, energy and materials, and continuous learning (Maughan, 2005). Interpretation of technological literacy is indeed disconcertingly diverse (Barnett, 1994). Gilster (1998) provides a general explanation on ICT literacy as “Digital Literacy” where he explains ICT literacy as the “ability to understand and to use information from a variety of digital sources”. It was argued that digital literacy is a broader concept than ICT literacy where there are more dimensions of ICT implementations should be considered while studying the digital literacy of an organization (Dulanjani & Priyanath, 2020).



Technological Literacy involves more hands-on skills in using technology when compared to the technology where it focuses on computers and the internet (Bugliarello, 2000). Technological literacy includes four competencies; "(a) able to accommodate and cope with rapid and continuous technological change, (b) generate creative and innovative solutions for technological problems, (c) act through technological knowledge both effectively and efficiently, and (4) assess technology and its involvement with the human lifeworld judiciously" (Gagel, 1997, p.25). According to Prime (1998), technological literacy consists of knowledge and skills which includes knowledge on technological problem solving, important technologies, social and cultural effects of technology, prerequisite knowledge from other disciplines, and the form or structure of technological knowledge. Technological literacy can be determined as a crucial knowledge resource, which can assist in gaining advantages emerging from the technological revolution (Kulathunga et.al, 2020).

Hence, many scholars have studied technological literacy as a knowledge resource that affects business performance. Osano (2019) shows that technological literacy is considered a vital knowledge resource that assist Small and Medium Enterprises (SMEs) to expand their businesses internationally. The impact of technological literacy on SME business performance ha been explored in many ways such as internal control systems, strategic decisions, and business processes. It has been found that Improved knowledge and skill with regard to technology, contribute to the implementation of a strong internal control system to improve the performance of SMEs (Kulathunga et.al, 2020). Limsarun (2015) notes that technological literacy affects the strategic decisions of an SME and thereby it affects the performance of the business. Akhtar el.at. (2014) have shown that SMEs's business processes and decisions become positively affected by the Internet and information technology adoption; it could also provide an opportunity to SMEs by bridging the gap among different markets, industries, competitors and partners in an economical way. Further, James (2007) explains that technological literacy enables a massive

network among the businesses, automation of business functions which provides higher productivity, and smooth flow of information that makes effective business decisions making. Therefore, it can be argued that a hands-on skill in using technology has an impact on business performance of micro and small enterprises. Hence the following hypothesis can be developed.

*Hypothesis 2: Technological literacy impacts on business performance of micro and small enterprises.*

### **3. Research Methodology**

#### **3.1 Sample and Data Collection**

In this research, we employed a structured questionnaire to collect data. The questionnaire surveys allow examining the views of a large number of people who are geographically scattered. Furthermore, it is an effective way of gathering information when an attitude, perception, or belief is the subject of interest (Robson & McCartan, 2016). Accordingly, in our study, the questionnaire was piloted by 55 entrepreneurs engaged with micro and small enterprises who registered for the Diploma in Small Business Management (DSBM) and Higher Diploma in Small Business Management (HDSBM) at the University of Colombo and operating in the Western Province, Sri Lanka within nine different sectors: Apparel, Hotel, Agriculture, Furniture, Bakery, Ayurvedic, Construction, Hardware, and Mill. The study addresses a broader range of sectors to increase the external validity of the research findings. Out of the questionnaire distributed, we were able to secure 48 responses which accounted for more than 87% of response success. The descriptive analysis of the business profiles is shown in Table 3.

**Table 3. Profile of the sample.**

	Frequency	Percentage
<b>Industry sectors</b>		
Apparel	12	25
Hotel	9	18.75
Agriculture	6	12.5
Furniture	3	6.25
Bakery	3	6.25
Ayurveda	3	6.25
Construction	1	2.08
Printing	3	6.25
Hardware	1	2.08
Milk	1	2.08
Trade	2	4.17
Saloon	2	4.17
Packaging	2	4.17
<b>Size</b>		
<10 employees	19	39.58
10-50 employees	23	47.92
51-300 employees	6	12.5
<b>No. of years of existence</b>		
< 3 years	5	10.42
3-7 years	15	31.25
7-15 years	16	33.33
> 15 years	12	25

*Source: Developed by Authors*

The profile of the sample was as follows: when considering the industry sector, the highest percentage (25%) of firms were from the apparel sector, while 18.7% and 12.5% of firms represented the hotel and agriculture sectors, respectively. When considering the number of employees, 47.9% of firms had 10–50 employees and 39% of firms had less than 10 employees. Almost 33% of MSMEs were operating for 7–15 years, while 31% of micro and small

enterprises were in 3-7 years of industry experience, while 10% of them were newly established firms.

### **3.2. Measurement of Variables**

To achieve the objectives of our study, we used eight variables, which were measured using items adapted from literature and modified according to suit the Sri Lankan context and were measured using a five-point Likert scale before and after the COVID 19. We considered the period before 11 March 2020 as 'Before COVID 19' and the period after 11 May 2020 as an 'After COVID 19'. To measure technological literacy, we used the variables under the sections of application of ICT infrastructure for business operations, ICT knowledge of employees, and ICT policy on conducting business operations, and were measured using a five-point Likert scale (Pham, 2010). For entrepreneurial competency, we created the four indexes by considering questions under the goal setting, systematic planning, and monitoring, persistence, and commitment (Baylie & Singh, 2019). Finally, we measured the performance of micro and small enterprises by using two indexes considering financial performance and non-financial performance (Chen et al., 2009; Orser & Riding, 2003). In each performance, we considered five questions to construct the index. Also, we computed the indexes for each of these sectors using min-max normalization.

### **3.3. The Model**

To investigate the changes in technological literacy, entrepreneurial competency, and business performance amidst the COVID-19 pandemic in Sri Lanka, we employed the paired sample t-test. The paired sample t-test is used to determine whether the mean difference between two sets of observations is zero for the same object. The purpose of the test is to determine whether there is statistical evidence that the mean difference between paired observations on technological literacy, entrepreneurial competency, and business performance from zero before and after COVID 19 periods. The test statistic for the paired samples t-test is depicted in equations (1) and (2) respectively.

$$t = \frac{\bar{x}_{diff} - 0}{S_{\bar{x}}} \quad (1)$$

where

$$S_{\bar{x}} = \frac{S_{diff}}{\sqrt{n}} \quad (2)$$

$\bar{x}_{diff}$  represents sample mean of the differences;  $n$  represents sample size;  $s_{diff}$  is sample standard deviation of the differences;  $S_{\bar{x}}$  captures estimated standard error of the mean  $(\frac{s}{\sqrt{n}})$ . In the next step, the linear cross-section regression model is estimated. A regression analysis to determine the relationship between the dependent variable (financial or non-financial performance) against the subsectors of Technological Literacy, and Entrepreneurial Competencies. The model is specified in equation (3):

$$y_i = x_i\beta_i + z_i\alpha_i + \varepsilon_i \quad (3)$$

The dependent variable in the model is financial or non-financial performance.  $x_i$  is a  $k \times 1$  vector of technological literacy include the application of ICT infrastructure for business operations, ICT knowledge of employees, and ICT policy on conducting business operations of firm  $i$ . In this study, explicitly measured entrepreneurial competency characteristics include goal setting, systematic planning and monitoring, persistence, and commitment respectively by using  $z_i$  in a  $k \times 1$  vector.  $\varepsilon_i$  represents unobserved firm characteristics. This study utilized the STATA 16 software to perform the paired sample t-test and regression analysis on the collected data.

#### 4. Data Analysis and Results

As recommended by Hair et al. (2016), Cronbach's alpha was applied to assess the reliability of latent variables. The results are summarized in Table 4. Accordingly, all the Cronbach's alpha values were higher than the threshold of 0.7, thus providing evidence for the reliability of the dataset.

**Table 4. Internal consistency reliability**

Section	Latent Variable	Cronbach's Alpha	
		(Before COVID 19)	(After COVID 19)
Technological Literacy	Application of ICT infrastructure for business operations	0.89	0.90
	ICT knowledge of employees and ICT policy on conducting business operations	0.89	0.90
		0.89	0.90
Entrepreneurial Competencies	Goal Setting	0.88	0.90
	Systematic Planning and Monitoring	0.89	0.89
	Persistence	0.89	0.89
	Commitment	0.89	0.89
Business Performance	Financial Performance	0.89	0.89
	Non-Financial Performance	0.89	0.89

Note: The time period before 11 March 2020 and time period after 11 May 2020 are considered to be Before COVID 19 and After COVID 19 respectively.

Source: *Developed by Authors*

We used a paired t-test to compare technological literacy, entrepreneurial competency, and business performance before and after COVID 19 (see Table 5). Shapiro-Wilk test was used to test the assumption of normal distribution. Data were analyzed with Stata 16 (Stata Corporation College Station, Texas, USA).

**Table 5. Mean difference between Index of Technological Literacy, Entrepreneurial Competency, and Business Performance before and after COVID 19**

Sectors	Index	Mean (Before COVID)	Mean (After COVID)	Mean Difference	Sig (P Value)
Technological Literacy	Application of ICT infrastructure for business operations	0.514838	0.41688	0.097958	0.0004***
	ICT knowledge of employees and ICT policy on conducting business operations	0.484783	0.397826	0.086957	0.0001***
	Entrepreneuria	0.371118	0.311335	0.059783	0.0019***
	I Competencies	0.430124	0.428261	0.001863	0.9591
	Systematic Planning and Monitoring	0.429766	0.428261	0.001505	0.9636
Business Performance	Persistence	0.396419	0.392754	0.003666	0.8634
	Commitment	0.408385	0.497826	-0.08944	0.0084***
	Financial Performance	0.388406	0.352174	0.036232	0.0883*
Non-Financial Performance	Performance	0.386288	0.304348	0.08194	0.0421**

Note: \*, \*\*, \*\*\* indicate 10%, 5% and 1% level of significance respectively, N=48.

The period before 11 March 2020 and period after 11 May 2020 are considered to be Before COVID 19 and After COVID 19 respectively.

Source: Developed by Authors

The paired t-test results (Table 5) showed a mean of infrastructure index before and after COVID-19 as 0.51 and 0.41 respectively which give a mean difference as 0.09. The test statistic suggests there is a statistically significant difference between the mean of infrastructure before and after COVID-19. Also, the results indicate statistical evidence that the mean difference of knowledge and policy indexes are statistically significant at the 1% level. The commitment index is the only index that the mean difference is statically significant under the entrepreneurial competencies. The financial and non-financial performance is statistically significant and suggests evidence of a difference in mean financial performance before and after COVID-19. Interestingly, other than the commitment of entrepreneurs, the coefficient of mean values of technological literacy and entrepreneurial competencies are lower for all the indexes after the COVID-19 period compared to before COVID -19 period. However, the mean value coefficients of entrepreneurial competencies are dropped marginally compared to technological literacy after the COVID-19. This implies firms considered strategies to overcome during the COVID-19-period particularly through the advancements in the entrepreneurial competencies where the significant increment in the commitment levels of the entrepreneurs supports this argument. Perhaps, despite the prevalence of the COVID-19 pandemic, the higher commitment of the entrepreneurs might be the reason for a slight drop in the mean value coefficient of the financial performance of firms after the COVID-19. However, we further investigate these findings using regression analysis (see Table 6).

**Table 6. Regression relating ICT, EC on FP and NFP before and after COVID 19**

	(1) Before COVID Financial Performance	(2) After COVID Financial Performance	(3) Before COVID Non-Financial Performance	(4) After COVID Non-Financial Performance
Application of ICT infrastructure for business operations	0.265 (1.26)	0.303 (1.37)	-0.0642 (-0.31)	0.0401 (0.17)
ICT knowledge of employees	0.365** (2.33)	-0.476*** (-2.90)	0.494*** (3.00)	-0.0388 (-0.21)



ICT policy on conducting business operations	-0.522*** (-2.88)	0.0678 (0.36)	-0.463** (-2.53)	0.0951 (0.45)
Goal Setting	0.292 (1.13)	0.697** (2.56)	-0.00497 (-0.03)	0.226 (1.29)
Systematic Planning and Monitoring	0.266* (1.69)	0.198 (1.20)	0.200 (1.32)	0.178 (1.02)
Persistence	0.00124 (0.01)	-0.234 (-1.00)	0.486** (2.58)	0.305 (1.41)
Commitment	0.137 (0.76)	0.397** (2.09)	-0.183 (-1.24)	0.0265 (0.16)
_cons	-0.0271 (-0.34)	-0.0186 (-0.22)	0.143 (1.47)	-0.0323 (-0.29)
<i>N</i>	46	46	46	46
<i>R</i> <sup>2</sup>	0.566	0.631	0.390	0.321

Note: t statistics in parentheses, \* p < 0.1, \*\* p < 0.05, \*\*\* p < 0.01. The time period before 11 March 2020 and time period after 11 May 2020 are considered to be Before COVID 19 and After COVID 19 respectively.

Source: Developed by Authors

Table 6 gives the regression model summary results for four models concerning before and after COVID-19. It presents R Square for each model which is the coefficient of determination measuring the extent to which the independent variables influence the dependent variable of the regression results. For example, R squared was 0.566 an indication that there was a variation of 56.6 percent on the financial performance of micro and small enterprises before COVID-19 due to changes in characteristics of technological literacy (application of ICT infrastructure for business operations, ICT knowledge of employees and ICT policy on conducting business operations) and entrepreneurial competency (goal setting, systematic planning and monitoring, persistence, and commitment). However, R squared was 0.39 therefore 39% of the variations in the non-financial performance of micro and small enterprises after COVID-19 are caused by the variations in characteristics of technological and entrepreneurial competency.

The regression findings presented also showed only the variables ICT knowledge of employees, ICT policy on conducting business operations, and systematic planning and monitoring were significant at 5%, 1%, and 10 % significant level respectively on financial performance before COVID-19. In contrast, the variables ICT knowledge of employees and goal setting were significant at 5%, and 1% significant level respectively after COVID-19. Also, the ICT policy on conducting business operations was negatively impacted on financial performance before COVID-19 indicating all other variables held at zero, a unit change in policy would lead to a 0.522 reduction in financial performance. In comparison to before COVID-19, the ICT knowledge of employees was negatively impacted on financial performance indicating a unit change in knowledge would lead to a 0.476 reduction in financial performance, while goal-setting and commitment would lead to 0.697 and 0.137 change in financial performance, respectively. The results are similar for non-financial performance before COVID-19 with financial performance, but the variable of persistence was significant and positively impacted. However, none of the variables were significant after COVID-19 on non-financial performance. Perhaps, these results are achieved due to the majority of the entrepreneurs in our sample are engaged with non-technological driven enterprises. Nonetheless, regardless of the industry, Amaratunge (2003) notes that most of the Sri Lankan entrepreneurs consider business initiatives as a means of employment generation in order to overcome poverty. Hence, they tend to give less priority to advance the technology used in micro and small businesses.

## 5. Conclusion

This research attempted to investigate the changes in technological literacy, entrepreneurial competency, and business performance amidst the COVID-19 pandemic in Sri Lanka. Accordingly, we employed the paired sample t-test to determine the mean difference between paired observations on technological literacy, entrepreneurial competency, and business performance from zero before and after COVID-19 periods. Also, we estimate a regression analysis to determine the relationship between the

dependent variable (financial or non-financial performance) against the subsectors of technological literacy, and entrepreneurial competencies. The model was tested with data collected via a structured questionnaire distributed among the micro and small enterprises in the Western Province of Sri Lanka. We used STATA 16 for the preliminary analysis. The paired sample t-test suggests there is a statistically significant difference between the mean of application of ICT infrastructure for business operations, ICT knowledge of employees, and ICT policy on conducting business operations under the sections of technological literacy, and commitment under the entrepreneurial competencies. Other than the commitment of entrepreneurial competencies, the mean values are lower for all the indexes after the COVID-19 period compared to before the COVID-19 period indicating the commitment of entrepreneurs may impact to increase their financial and non-financial performance after the COVID-19 period. The regression findings indicate that the goal setting and commitment would positively impact financial performance, while the ICT knowledge of employees negatively impacts financial performance after COVID 19. This denotes the necessity of transforming the micro and small enterprises from their conventional business setup to modern technology in order to overcome potential challenges that may be caused particularly due to the COVID-19 pandemic. Thus, the entrepreneurial competencies will be a key factor in achieving this and the higher level of commitment shown by the entrepreneurs will stimulate this transformation process. In this study, we can identify some implications for the policymakers where they need to devise suitable short and long-term strategies to improve technological knowledge and skills of micro and small entrepreneurs in Sri Lanka. This is inevitable to achieve business success and thereby the overall economic development of the country.

## References

- Akhtar, N., Azeem, S. M., & Mir, G. M. (2014). Strategic Role of Internet In Smes Growth Strategies. *International Journal of Business Management & Economic Research*, 5(2).

- Amaratunge, S. (2003). Role of small industries in economic development of Sri Lanka', *First international symposium on business management of Developing countries*, Faculty of Management studies and Commerce, Sri Jayewardenapura University. Colombo.
- Barnett, M. (1994). Literacy, technology and 'technological literacy'. *International Journal of Technology and Design Education*, 5(2), 119-137.
- Basu, A. and Goswami, A. (1999), South Asian entrepreneurship in Great Britain: Factors influencing growth, *International Journal of Entrepreneurial Behaviour & Research*, 5 (5), 251-275.
- Baylie, A., and Singh, M. (2019). Entrepreneurial competencies and success of Small and Medium Enterprises (SMEs): Evidence from Ethiopia. *European Journal of Business and Management*, 11(19), 14-31.
- Bird, B. (1995), Towards a theory of entrepreneurial competency. *Advances in Entrepreneurship, Firm Emergence and Growth*, 2, 51-72.
- Boldureanu, G., Ionescu, A., Bercu, A., Bedrule-Grigorut, M. V. & Boldureanu, D. (2020). Entrepreneurship Education through successful entrepreneurial models in higher education institutions. *Sustainability*, 12, 1-33.
- Bugliarello, G. (2000). Reflections on technological literacy. *Bulletin of Science, Technology & Society*, 20(2), 83-89.
- Chandler, G. N., and Hanks, S. H. (1994). Founder competence, the environment, and venture performance. *Entrepreneurship theory and practice*, 18(3), 77-89.
- Chen, J. S., Tsou, H. T. & Huang, A.Y.H. (2009), Service delivery innovation: antecedents and impact on firm performance, *Journal of Service Research*, 12 (1), 36-55.
- De Silva, W., Kodikara, P., & Somarathne, R. (2014). Sri Lankan youth and their exposure to computer literacy. *Sri Lanka Journal of Advanced Social Studies*, 3(1).
- Department of Census and Statistics, Sri Lanka (2017). Economic Census 2013/14: *Final Report on Informal Non Agricultural Activities*. Department of Census and Statistics, Sri Lanka.

- Department of Census and Statistics, Sri Lanka (2019). *Computer Literacy statistics – 2019 (Annual)*. Department of Census and Statistics, Sri Lanka.
- Dulanjani, P. A., and Priyanath, H. M. S. (2020). Intellectual Capital and Business Performance of Self-employers in Sri Lanka: An Empirical Investigation. *International Journal of Research and Innovation in Social Science (IJRISS)*, 4 (5)
- Gagel, C. W. (1997). Literacy and technology: Reflections and insights for technological literacy. *Literacy*, 34(3).
- Gasse, Y., d'Amboise, G., Simard, G. & Lasker, K. (1997). Entrepreneurial-Managerial Competencies and Practices of Growing SMEs – Summary of Results from an Empirical Study (Preliminary), Centre for Entrepreneurship and SME and Entrepreneuriat Laval, Universite´ Laval, Montre´al.
- Gunawardena, D. P. (2020). The impact of COVID19 on the MSME sector in Sri Lanka. UN DESA/DSDG.
- Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*. CA: Sage Publications.
- James, J. (2007). From origins to implications: Key aspects in the debate over the digital divide. *Journal of Information Technology*, 22(3), 284-295.
- Khan, F. R. (2014). Socio-economic factors influencing entrepreneurship development: An empirical study across the small & medium enterprises of Chennai, State of Tamil Nadu, India. *International Journal of Students Research in Technology & Management*, 2(3), 89-94.
- Kocherbaeva, A., Samaibekova, Z. & Isabaeva, K. (2019). Leadership and leaders in successful small and medium enterprises. 4th International Conference on Social, Business, and Academic Leadership (ICSBAL 2019), pp. 89-94.
- Kulathunga, K. M. M. C. B., Ye, J., Sharma, S., & Weerathunga, P. R. (2020). How Does Technological and Financial Literacy Influence SME Performance: Mediating Role of ERM Practices. *Information*, 11(6), 297.
- Limsarun, T. (2015). The Sustainability of Small and Medium-sized Enterprises (SMEs) in A Digital Economy Era. *Journal of Business Administration The Association of Private Higher Education Institutions of Thailand*, 4(2), 113-124.

- Man, T. W. T. & Lau, T. (2005). The context of entrepreneurship in Hong Kong: An investigation through the patterns of entrepreneurial competencies in contrasting industrial environments. *Journal of Small Business and Enterprise Development*, 12(4), 464–481.
- Man, T., Lau, T. & Chan, K.F. (2002), The competitiveness of small and medium enterprises. A conceptualisation with focus on entrepreneurial competencies. *Journal of Business Venturing*, 17(2), 123-142.
- Martin, G. and Staines, H. (1994), Management competencies in small firms. *International Journal of Management Development*, 13(7), 23–34.
- Maughan, G. R. (2005). Electronic Performance Support Systems and Technological Literacy. *Journal of Technology Studies*, 31 (1), 49-56.
- Ministry of Industry and Commerce. Sri Lanka (2017). *National Policy Framework for SME Development*. Ministry of Industry and Commerce. Sri Lanka.
- Mitchelmore, S., and Rowley, J. (2010). Entrepreneurial competencies: a literature review and development agenda. *International Journal of Entrepreneurial Behaviour & Research*, 16(2), 92–111.
- Murray, G. (1996), A synthesis of six exploratory European case studies of successfully exited, venture capital-financed, new technology-based firms. *Entrepreneurship Theory and Practice*, 20 (4), 41–60.
- Omerzel G.D., and Antončič, B. (2008). Critical entrepreneur knowledge dimensions for the SME performance. *Industrial Management & Data Systems*, 108(9), 1182- 1199. <https://doi.org/10.1108/02635570810914883>
- Orser, B., and Riding, A. L. (2003). *Management Competencies and SME Performance Criteria: A Pilot Study*. Canada: Equinox Management Consultants Limited
- Osano, H. M. (2019). Global expansion of SMEs: role of global market strategy for Kenyan SMEs. *Journal of Innovation and Entrepreneurship*, 8(1), 13.
- Pansiri, J. and Temtime, Z. T. (2008). Assessing managerial skills in SMEs for capacity building. *Journal of Management Development*, 27(2), 251–260.

- Pham, Q.T. (2010). Measuring the ICT maturity of SMEs. *Journal of Knowledge Management Practice*, 1(1),1-14.
- Popescu, L., Iancu, A., Avram, M., Avram, D. & Popescu, V. (2020). The role of managerial skills in the sustainable development of SMEs in Mehedinti County, Romania. *Sustainability*, 12, 1-26.
- Prime, G. (1998). Tailoring assessment of technological literacy learning. *The Journal of Technology Studies*, 24(1), 18-23.
- RezaeiZadeh, M., Hogan, M., O'Reilly, J., Cunningham, J., & Murphy, E. (2017). Core entrepreneurial competencies and their interdependencies: Insights from a study of Irish and Iranian entrepreneurs, university students and academics. *International Entrepreneurship and Management Journal*, 13(1), 1-39.
- Robson, C., and McCartan, K. (2016). *Real world research*. UK: John Wiley & Sons
- Santandreu-Mascarell, C., Garzon, D. & Knorr H. (2013). Entrepreneurial and innovative competences, are they the same?. *Management Decision*, 51(5),1084-1095.
- Solesvik, M. Z. (2012). Entrepreneurial competencies in emerging economy context. 17th Nordic Conference on Small Business Research, Helsinki: Helsinki, Finland.
- Tehseen, S. and Ramayah, T. (2015). Entrepreneurial competencies and SMEs business success: The contingent role of external integration. *Mediterranean Journal of Social Sciences*, 6(1), 50-61.
- Tseng, C. and Tseng, C. (2019). Corporate entrepreneurship as a strategic approach for internal Innovation performance. *Asia Pacific Journal of Innovation and Entrepreneurship*, 13 (1), 108-120.
- Wickramaratne, A., Kiminami, A., and Yagi, H. (2014). Entrepreneurial competencies and entrepreneurial orientation of tea manufacturing firms in Sri Lanka. *Asian Social Science*, 10(18), 50.

# Submission Guidelines

## Word Limit

- Article: Between 2,000 - 8,000 words (Maximum 30 pages including reference list, tables and figures).
- Keywords: Between 4 - 8 keywords.
- Title: Approximately in eight words.

## Format

- Articles must be typed, double-spaced and single-sided and numbered using Arial font size 10.
- Title of the article should be in Arial font size 14.
- Title page must include the names, titles, degrees, affiliations and correspondence information for all authors.
- Tables and figures should be printed in separate pages and should be numbered in the order in which they are referred to in the text, e.g. : (Table 1), (Figure 1).
- All acronyms used repeatedly should be cited in its entirety along with abbreviation in parentheses on first reference. e.g. : National Centre for Advanced Studies (NCAS).
- All subsequent citations should use only the abbreviation.

## References

- The journal uses footnotes rather than endnotes.
- Place the footnote number at the end of the sentence in which it appears.
- Old documents cited in the text must be included in the reference list at the end of the paper.
- Use APA style of referencing.

## Submission

- Manuscripts must be submitted electronically on a CD or by e-mail to editor@ncas.ac.uk preferably in Microsoft Word (.doc or .docx) or Open Document Format (.odf).
- All submitted manuscripts are subject to peer editorial review and revision; those that are accepted will be edited according to the journal standards.

## Submission Policy

- Papers submitted to the Journal should contain original work.
- Papers that have been published or accepted for publication elsewhere will not be considered.
- The Editorial Board adopts strict rules to prevent plagiarism. Electronic software tools and other devices are used to cross check any plagiarism.

## Checklist

Ensure that the following are included with the article.

- Author details in full.
- A word count.
- An abstract.
- Keywords.
- References in APA style.
- Tables (as applicable) numbered using Roman numerals and mentioned in the text.
- Figures (as applicable) numbered using Arabic numerals and mentioned in the text.