“Internet-based ICT usage by South African SMEs: are the benefits within their reach?”

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Abstract

Information and communications technology (ICT) is used to access and communicate information. The technology involved includes the Internet, wireless networks and cell phones (TechTerms, 2010). It is estimated that 70 to 80% of small and medium enterprises (SMEs) fail within two years of operation (Cant & Ligthelm, 2003). ICT has been thus identified as a crucial key success factor for SMEs in today's world. This research study investigated small businesses' perceptions of the benefits of adopting ICT in the small business sector in South Africa. The objective of this paper is to determine ICT adoption among South African SMEs and the benefits associated with it. As part of this study the level of understanding of ICT and its application in a SME context is evaluated. A questionnaire was constructed and judgement sampling was used to gather the responses of 90 small businesses. The research identified that over the half of SMEs are currently using two to three ICT devices to run their businesses and those that have adopted Internet-based ICT functions are reaping the benefits. The challenge now is to further increase the adoption of ICT among small businesses in South Africa to ensure their success, as they play a vital role in the South African economy.

Keywords: South African SMEs, developing countries, information communication technology, ICT, adoption, benefits.
JEL Classification: M19.

Introduction

Small and medium enterprises (SMEs) often encounter difficulties owing to a lack of resources and the vulnerability such enterprises experience during their development stages. Many South African SMEs fail as a result of various macro-environmental factors, such as inflation, interest rates, management skills, lack of a market and crime (Cant & Wiid, 2013). However, SMEs play a crucial role in any economy, but especially in developing countries, such as South Africa, where there are significant unemployment and income distribution challenges (Kongolo, 2010). Approximately 91% of formal business entities in South Africa are SMEs, contributing between 51 and 57% to GDP and 60% of employment (Kongolo, 2010). Owing to the significant impact that the continued existence of SMEs can have on the economy of any country, it is essential that everything possible be done to ensure their success and long-term survival. This implies that all means must be used in order to ensure survival, including technology.

The Internet has changed many aspects of society, including the way we conduct business, create and share information and organize the flow of ideas around the world (Manyika & Roxburgh, 2011). Manyika and Roxburgh (2011) state that in the past five years, the Internet has contributed to 21% of GDP growth in developed countries and many SMEs have benefitted from the Internet's influence. This, coupled with the increasing number of Internet users worldwide, has encouraged countless SMEs, in both developed and developing countries, to adopt Internet-based information and communication technology (ICT).

There have been numerous studies conducted on the adoption of ICT among SMEs in developed countries. However, there has been limited research on developing countries and, more specifically, South Africa, regarding the adoption and use of ICT. Furthermore, the findings of SMEs in developed countries cannot be generalized to SMEs in developing countries, as they each face different barriers specific to them (Kapurubandara & Lawson, 2006). This does not, however, mean that the lessons learnt from developed countries cannot be extrapolated to SMEs in developing countries. Therefore, the aim of this study was to investigate small businesses' adoption of ICT in South Africa, and their perception of the benefits experienced. In the subsequent section of this paper, a review of the available literature is provided, followed by the objectives and research methodology used in the study. In conclusion, the research findings are discussed and a number of recommendations and remarks are made.

SMEs in South Africa: an overview. An SME is defined by the National Small Business Amendment Act of South Africa, 2004, as any separate business entity, including cooperative enterprises and non-governmental organizations, managed by one owner or more. Such business entities are found in any sector or subsector of the economy and can be defined as a micro-, a very small, a small or a medium enterprise, depending on the number of

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employees, total annual turnover and total gross asset value (Government Gazette of the Republic of South Africa, 2004). Table 1 below illustrates the average number of employees per category (micro-, very small, small and medium), the total annual turnover amount generated per size and the total gross asset value per class, across different industries.

Table 1. Defining SMEs

Size or class	Total full-time equivalent of paid employees less than	Total annual turnover less than	Total gross asset value (fixed property excluded) less than
Micro	5	R0.15 m	R0.10 m
Very small	10–20	R0.40 m-R5.00 m	R0.40 m-R2.50 m
Small	50	R2.00m-R25.00 m	R2.00 m-R4.50 m
Medium	120–200	R4.00 m-R40.00 m	R4.00 m-R8.00 m

Source adapted from: http://www.beesknees.co.za/startup/small-business.htm.

SMEs and ICT. The Internet provides SMEs with opportunities to compete successfully in both the domestic and the international markets (Kapurubandara & Lawson, 2006). Internet-based ICT is simply described as the technologies used to access and communicate information via the Internet (TechTerms, 2010). ICT consists of all kinds of technology, ranging from networks, computers and websites to telephones, cellphones and other wireless mobile devices (Mpofu, Milne & Watkins-Mathys, n.d.). Today, ICT is seen as a success factor for any business, particularly SMEs, as it allows them to remain competitive. By using it effectively, SMEs in developing countries have the ability to ensure sustainable economic and social development (Kapurubandara & Lawson, 2006). Successful SMEs are the backbone of any economy as they create jobs and wealth for a country.

According to Modimogale (2008), SMEs can be categorized into one of three groups based on the roles or strategic position that ICT plays:

- *General-user ICT group*. These are SMEs that use basic ICT tools, such as e-mail and Internet, to conduct business.
- *Production-integrating ICT group*. These are SMEs that link ICT to the production processes. This is more complex and, therefore, requires the necessary skills for implementation.
- *Market-orientated ICT group*. These are SMEs that use the Internet as a marketing tool and have a website that provides more information on the company; they are likely to have e-commerce functionality.

Alam and Noor (2009) state that in order for SMEs to ensure competitiveness, they need to incorporate ICT into their businesses. Dholakia and Ksherti (2004) point out that ICT increases an SME's ability to compete with other firms, helps to create opportunities for diversity among entrepreneurs, and offers convenient and easy ways of conducting business more cost-efficiently. However, introducing ICTs may also lead to confusion and added pressure on SMEs, as they already struggle with other day-to-day challenges (Ritchie & Brindley, 2005). However, the benefits of adopting ICT include:

- lower operating costs in communicating with various stakeholders;
- improved communication resulting in increased delivery speed;
- increased efficiency through better coordination within the value chain;
- new opportunities offered by the increased market exposure;
- advanced information exchange with stakeholders;
- identification of latest approaches for managing and organizing the business (Tan, Chong, Lin & Eze, 2010).

Although many SMEs show keenness towards adopting ICT and have the ability to do so as they are flexible in terms of their structure, systems and processes, many are reluctant (Tan et al., 2010; Ritchie & Brindley, 2005). The progression of the majority of SMEs towards adopting or making full use of ICTs has been slow owing to the fact that they experience numerous challenges or have yet to reap any benefits (Tan et al., 2010; Ritchie & Brindley, 2005). Hashim (2007) states that the number of SMEs adopting ICTs is still lower than expected, but it is hoped that as SMEs become more entrenched in the usage of ICT this trend will be reversed.

Alam and Noor (2009) argue that ICT adoption is dependent on four variables, namely, the perceived benefits and costs involved, the ICT knowledge and skills of the employees, external factors and, lastly, government support. Previous studies highlight that the more benefits that SMEs seem to gain, the greater the possibility of it adopting ICT; equally, the more the perceived costs involved, the more reluctant SMEs are to adopt ICT (Alam & Noor, 2009). Furthermore, SMEs generally tend to avoid adopting ICT in their business if the owner/manager and employees find it too complex and are unfamiliar with it (Alam & Noor, 2009). Conversely, SMEs are more likely to adopt ICT if their trading partners, competitors or the industry have adopted ICT and are pressuring them to do so (Alam & Noor, 2009). Nevertheless, government support plays a crucial role in SMEs adopting ICT as they are able to create and implement support

programs by leveraging resources with other stakeholders and providing tax incentives for SMEs (Alam & Noor, 2009; Mpofu et al., n.d.).

SME and ICT adoption. A study conducted by Hashim (2007) found that the ICT skills of the owner/manager or employees of SMEs play a fundamental role in SMEs adopting ICT. Although governments, such as Malaysia and Taiwan, encourage SMEs to adopt ICTs by providing various support structures, many still have not done so because they lack ICT skills (Hashim, 2007). Similarly, a study conducted in the UK found that SME owners/ managers do not have sufficient knowledge of ICTs to make accurate investment decisions, and lack the skills to maintain the systems, resulting in extra costs as they require assistance from external consultants (Harindranath, Dyerson & Barnes, 2008). Mokaya and Njuguna (2012) found that the level of education of Kenyan owners/managers influenced ICT adoption, as those that had at least a college level of education and made use of ICT tools were more likely to use ICT on a regular basis.

In addition, the availability of skilled and educated employees in a business plays an important role. Accordingly, a study conducted by Basant, Commander, Harrison and Menezes-Filho (2006) found that Brazilian SMEs that had employees with higher levels of education were more inclined to adopt ICT. Furthermore, Tan and Eze (2008) state that Malaysian SMEs do not adopt ICT because there is no need to do so in order to conduct their business and the financial implications involved are simply too risky. The study also found that SMEs are reluctant to use ICT because of the security risks involved in its use (Tan & Eze, 2008). Basant et al. (2006) add that governmental inefficiencies and weak infrastructure have had a negative impact on the level of adoption, as has lower returns on investment. These issues need to be addressed at state level if a higher level of adoption is expected.

On the other hand, Harindranath et al. (2008) highlight the fact that 90% of respondents in their study were satisfied with their ICT investment and perceived it to be beneficial as it increased the response time to customers, improved overall productivity and assisted in keeping up with competitors. Similarly, Bassant et al. (2006) found that ICT had a direct positive influence on productivity and increased returns in India and Brazil, respectively. However, Bassant et al. study points out that SMEs only experience positive return on investment after a certain threshold, meaning that low intensity users receive little or no return (Bassant et al., 2006). Gallego, Gutiérrez and Lee (2013) state that even though SMEs in developing countries face tremendous barriers to adopting ICT, there is considerable evidence suggesting that they have the potential to achieve major productivity improvements and economic growth.

SME and ICT in the South African context. A survey conducted by the National Youth Development Agency (NYDA) in 2010 found that even though the majority of emerging (59%) and established (79%) SMEs have access to the Internet, there is still a significant number of SMEs that have no Internet connectivity whatsoever. Table 2 below highlights the percentages of Internet connectivity of South African SMEs. One of the reasons why there is such a high number of SMEs without Internet access is that South Africa is considered one of the most expensive countries in terms of Internet costs and has one of the slowest connectivity speeds (HumanIPO, 2013). South Africa is placed 58 out of 64 countries that were used to compare the broadband access versus cost ratio (HumanIPO, 2013).

Table 2. South African SME Internet connectivity

	Emerging SMEs	Established SMEs
No internet connectivity	37%	17%
GPRS connectivity	2%	2%
3G connectivity	6%	3%
ADSL connectivity	51%	74%

Source adapted from: http://www.gov.za/small-and-medium-enterprise-sme-survey-2010-connectivity-big-issue-emerging-sme-market.

Gono, Hariandranath and Özcan (n.d.) conducted a study on ICT adoption among South African SMEs in the manufacturing and logistics industry. The study found that the majority of the respondents lacked ICT knowledge and, therefore, required external expertise; this highlights the lack of skills within the workforce (Gono et al., n.d.). The study also concluded that SMEs were dependent on their supply chain relationship which required them to not only maintain these relationships but also to keep up with developments in technology (Gono et al., n.d.). Similarly, another study conducted among small hotel establishments in South Africa stated that the main pressures to adopt ICT came from various stakeholders, namely, customers, suppliers and competitors (Mpofu et al., n.d.). The study also highlighted the importance of the owner's/manager's support and knowledge of ICT (Mpofu et al., n.d.).

1. Research objectives

The main aim of this study was to establish ICT adoption and the benefits thereof in South African SMEs. More specifically, the following objectives were set:

- To ascertain to what extent small businesses in South Africa are making use of ICT.
- To identify the perceived benefits of ICT usage for South African SMEs.

2. Methodology

The research followed a quantitative analysis of the research question to establish what the extent of use and the perceived benefits of ICT adoption for South African SMEs are. To address this problem adequately, the research methodology was based on the primary data collected from South African SMEs. A quantitative survey questionnaire was used that measures ICT adoption benefits through Likert-type scales. These scales consisted of five scale points with labels ranging from strongly disagree to strongly agree. The data are quantified and analyzed by examining the frequency of occurrences and the importance of the problem. Cluster analysis was used to establish whether there are distinct patterns among the respondents regarding how important they rated the various factors as benefits to SMEs when they adopt ICT to communicate and/or conduct business. A sample of SME owners/managers and employees were asked to what extent they were using ICT devices. A total of 90 usable responses were received which can only give a general indication of ICT adoption and the benefits of ICT adoption in South African SMEs. The respondent group consisted of owners (79%), managers (19.7%) and staff (1.3%).

3. Research findings

3.1. The extent to which small businesses in South Africa are making use of ICT. In order to determine the extent to which SMEs are using ICT devices and Internet-based ICT, the number of devices recorded as being used by each respondent and the number of Internet-based ICT functions used were calculated.

The majority of the SMEs included in the survey (65.9 %) was using at least two ICT devices. 23% of SMEs was using all three devices listed in the questionnaire and none was using no ICT devices (Figure 1).

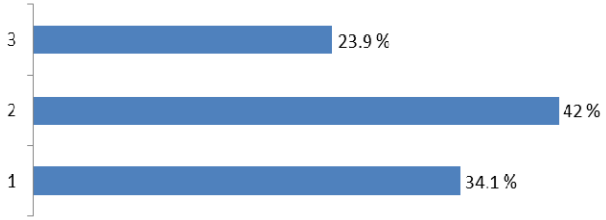

Fig. 1. Number of ICT devices in use

At least two Internet-based ICT functions were used by 66.6% of the SMEs included in the survey. Only 3.2% of them did not use any of the ICT functions. Just a few respondents (15.7%) were using four or more of the six functions listed in the questionnaire (Figure 2).

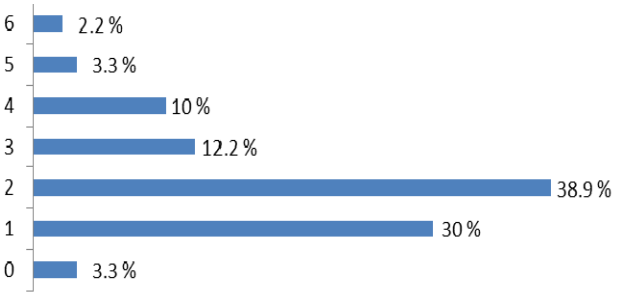

Fig. 2. Number in Internet-based functions in use

From the number of ICT devices and Internet-based ICT functions that are in use by the respondents it can be seen that use of the three ICT devices was quite high, with 66.5% of the respondents using at least two of the three devices listed in the questionnaire. The use of Internet-based ICT functions could be improved, however, with 3.3% of the respondents not using any Internet-based ICT functions.

3.2. The perceived benefits of ICT usage. The respondents were asked to indicate the extent to which they agreed with a number of statements that describe certain benefits that SMEs gain when adopting ICT to communicate and/or conduct business on a scale of one to five, with higher values corresponding to higher levels of agreement (Table 3).

Table 3. Frequency table of benefits of ICT use

		Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree	Mean
ICT leads to lower correspondence cost	Count	18	14	9	33	16	3.17
	Row N %	20.0%	15.6%	10.0%	36.7%	17.8%	
ICT increases speed and reliability of business communication	Count	14	12	8	36	20	3.40
	Row N %	15.6%	13.3%	8.9%	40.0%	22.2%	
ICT reduces inefficiencies within value chain	Count	13	12	15	39	11	3.26
	Row N %	14.4%	13.3%	16.7%	43.3%	12.2%	

Table 3 (cont.). Frequency table of benefits of ICT use

	Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree	Mean	
ICT builds closer relationships	Count	10	13	18	40	9	3.28
	Row N %	11.1%	14.4%	20.0%	44.4%	10.0%	
ICT are better communication tools with customers	Count	9	17	10	39	15	3.38
	Row N %	10.0%	18.9%	11.1%	43.3%	16.7%	
ICT enhances access to market information and knowledge	Count	8	18	8	41	15	3.41
	Row N %	8.9%	20.0%	8.9%	45.6%	16.7%	
ICT facilitates new ways of managing and organizing businesses	Count	9	21	5	34	21	3.41
	Row N %	10.0%	23.3%	5.6%	37.8%	23.3%	

The graph in Figure 3 depicts the distribution of respondents among the agreement levels sorted according to the proportions of respondents that selected "Agree".

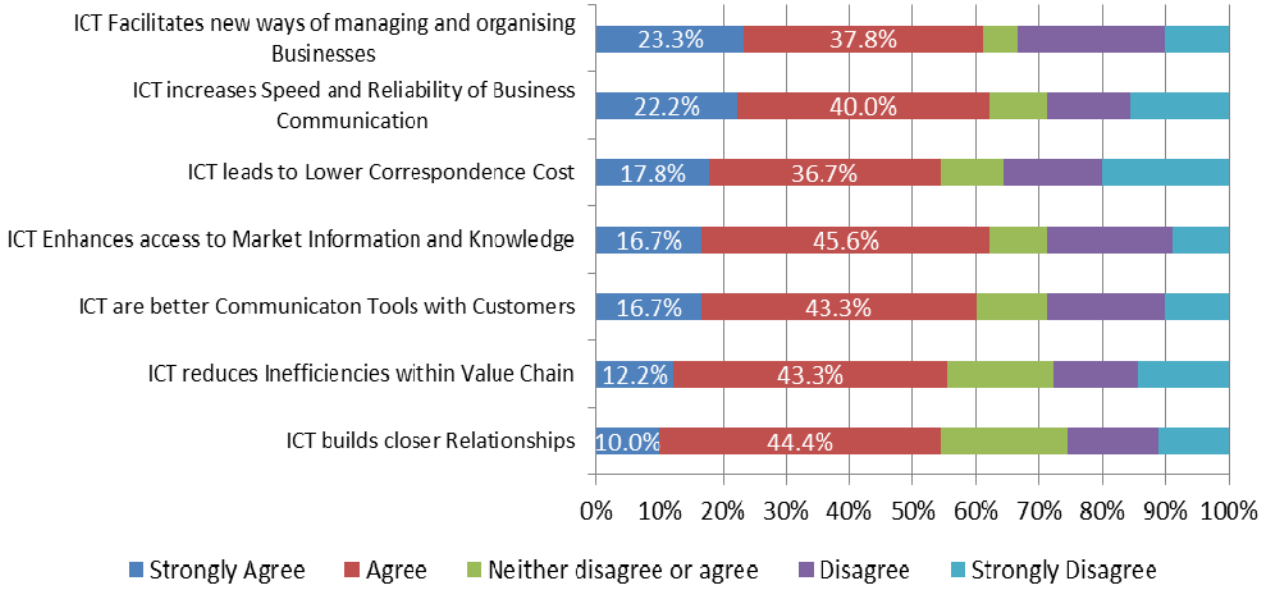

Fig. 3. Agreement levels of benefits of ICT use

Treating the variable as continuous, and keeping in mind that higher values correspond with higher levels of agreement with a statement, it is clear that the two highest rated ICT benefits are that it enhances access to market information and knowledge (mean = 3.41) and facilitates new ways of managing and organizing businesses knowledge (mean = 3.41). This is followed by the increase in the speed and reliability of business communication (mean = 3.40) and better communication tools with customers (mean = 3.38). Other benefits include building of closer relationships (mean = 3.28), reduction of inefficiencies within the value chain (mean = 3.26) and the fact that ICT leads to lower correspondence costs (mean = 3.17).

All of the mean values are higher than the middle value (3) of the scale (from 1 to 5) used to express the extent to which a respondent agreed with the statements, indicating that most of the respondents agreed that all seven statements are benefits of using ICT.

Table 4. Mean values of agreement for the benefits to ICT usage

	N	Mean	Std. deviation
ICT leads to lower correspondence costs	90	3.17	1.424
ICT increases speed and reliability of business communication	90	3.40	1.380
ICT reduces inefficiencies within the value chain	90	3.26	1.259
ICT builds closer relationships	90	3.28	1.171
ICT provides tools for better communication with customers	90	3.38	1.250
ICT enhances access to market information and knowledge	90	3.41	1.235
ICT facilitates new ways of managing and organizing businesses	90	3.41	1.340

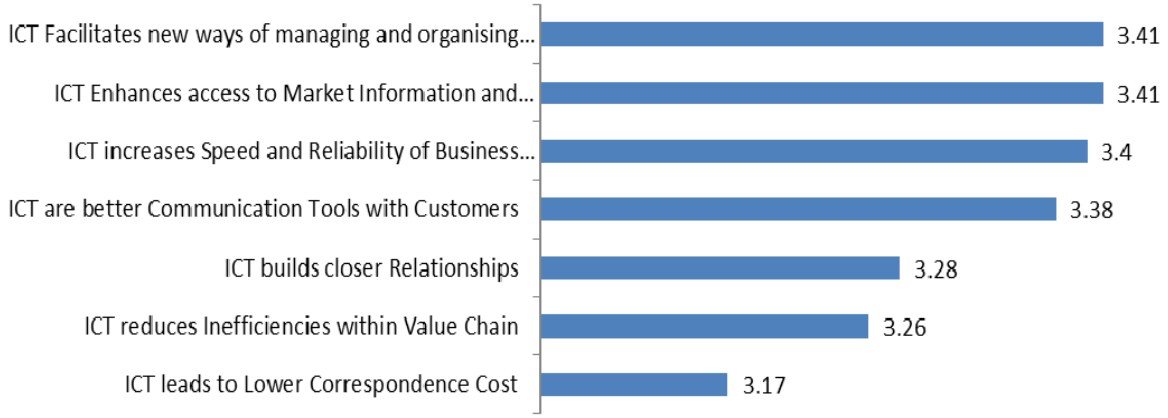

Fig. 4. Mean levels of agreement for the benefits to ITC usage

3.3. Reliability analysis. To establish whether the seven questions of the theme "Benefits of ICT" are related, an item analysis was performed. An initial overall Cronbach's alpha value of 0.957 was recorded for the seven questions. High correlations (above 0.56) exist between all the questions in this theme. The seven questions are, therefore, related to the theme "Benefits of ICT".

3.4. Cluster analysis. To establish whether there are distinct patterns among the respondents regarding how important they rated the various factors as benefits to SMEs when they adopt ICT to communicate and/or conduct business, the seven items were subjected to two-step cluster analysis. Two different groups were distinguished, indicating that respondents do have different opinions regarding how important they rated the various factors as benefits. The one group consisted of 34 respondents and the second group of 56 respondents. The cluster centre values of the separate groups are depicted in Figure 5. Respondents belonging to Cluster 1 did not consider the factors very important benefits for SMEs. The mean rating of the seven factors by respondents in Cluster 1 was 2.02, which is below the average of 3. Cluster 1 can be described as the "Not Agree" group. By contrast, respondents in Cluster 2 were more positive about the factors being a benefit to SMEs and their average rating was 4.12. Cluster 2 can be described as the "Agree" group.

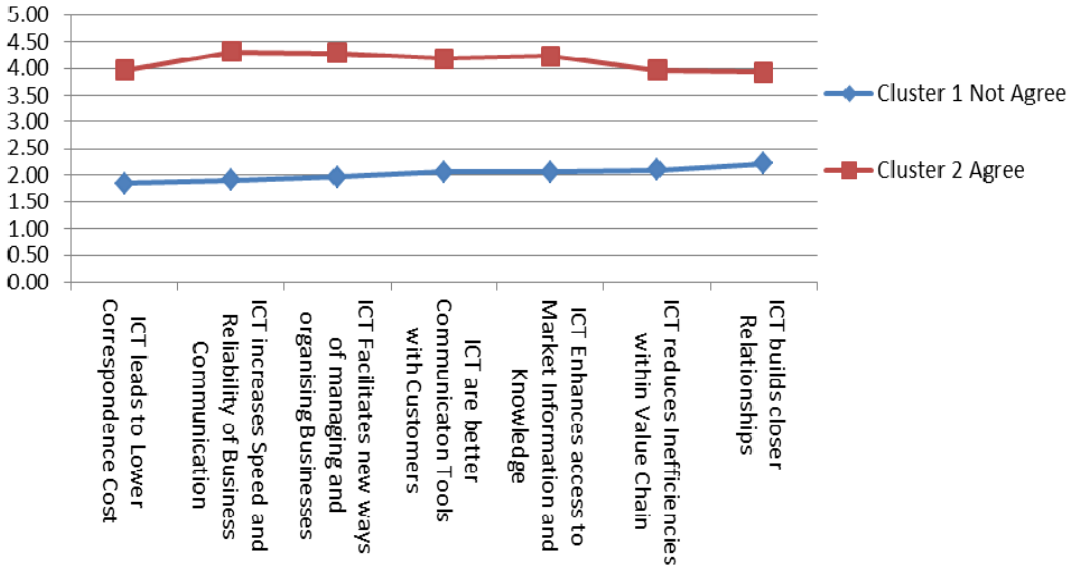

Fig. 5. Central values for the benefit clusters

To understand why there is such a difference between the two clusters in their perception of the benefits to SMEs, the use of ICT devices and Internet-based ICT functions by the different cluster groups was investigated. The percentages of respondents per cluster who use the devices/functions are depicted in Figure 6. The Chi-square test was used to test for significant relationships between the cluster group and the percentage of respondents using ICT devices/functions.

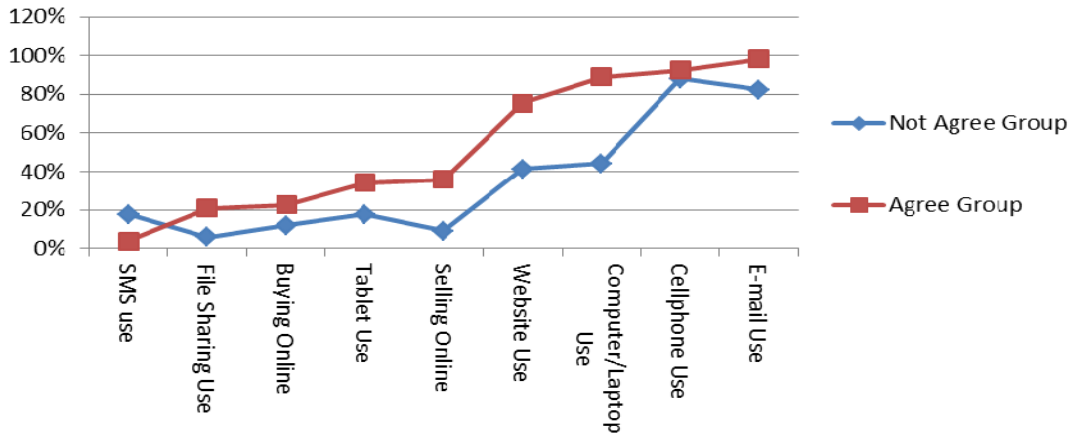

Fig. 6. Percentage of respondents using the ICT devices/function in each cluster

Significant relationships ($p < 0.05$) were found for computer/laptop use, e-mail use, website use, selling online and SMS use (Table 5). For all of these devices/functions, the Agree group had a significantly higher percentage of respondents using them than the Not Agree group. There is, therefore, a significant relationship between the cluster groups and the percentage of respondents using computers/laptops, e-mail, websites, onsite selling and SMS services to conduct business, with the higher percentage of users from the Agree group.

Table 5. Percentage of respondents who use ICT devices and functions and the results from the Chi-square test

ICT devices/functions in use	Not agree group %	Agree group %	Pearson Chi - square	*p*-value
Cellphone use	88.2	92.6	0.479	0.489
Computer/laptop use	44.1	88.9	20.560	0.000
Tablet use	17.6	34.0	2.760	0.097
E-mail use	82.4	98.1	6.957	0.008
File sharing use	5.9	20.8	3.605	0.058
Website use	41.2	75.5	10.347	0.001
Selling online	8.8	35.8	8.007	0.005
Buying online	11.8	22.6	1.633	0.201
SMS use	17.6	3.8	4.774	0.029

Conclusion and recommendations

ICT consists of all kinds of technologies, ranging from networks, computers and websites to telephones, cellphones and other wireless mobile devices (Mpofu et al., n.d.). The study aimed to determine ICT adoption among South African SMEs and the type of ICTs commonly used. It is clear from the number of ICT devices and Internet-based ICT functions that are in use by the respondents that the adoption of ICT devices is fairly good with 66.5% of the respondents using at least two of the three devices listed in the questionnaire and 23.9% of the respondents using all three devices.

The study further aimed to find out what the perceived benefits of ICT usage are. It was found that on average the respondents agreed that all seven statements are beneficial to ICT use. The top-rated benefits were that it enhances access to market information and knowledge, facilitates new ways of managing and organizing businesses knowledge, the increase in speed and reliability of business communication and better communication tools with customers. Other benefits include building of closer relationships, reduction of inefficiencies within the value chain and the resulting lower correspondence costs.

Cluster analysis revealed two groups. The one group agreed more that the statements were beneficial to ICT than did the other group. A significant relationship was found between the cluster group and the percentage of respondents using computer/laptop, e-mail, websites, selling online and SMS in their businesses, with the higher percentage of respondents using these functions and devices falling into the Agree group. This shows that respondents who have not adopted ICT in their SMEs do not see the benefits of using it. These findings indicate that SMEs should become more aware of the ICT devices and Internet-based ICT functions which they can use to enhance their SMEs. If all of SMEs were to have cellphones and computers/laptops, they would be able to explore the uses and benefits of Internet-based functions. Those SMEs that have already adopted ICT in their business are aware of the benefits.

The limitations of this study need to be acknowledged and taken into consideration before any recommendations are made. Firstly, the sampling size that was used was small (n = 90), which can only give a general indication of ICT adoption and the benefits of ICT adoption in South African SMEs. Therefore, the variables identified cannot be generalized as being representative of all South African SMEs.

It has been emphasized that SMEs play a crucial role in the economy, and that ICT is a key factor in ensuring the SMEs' success. ICT allows for better management and organization of business, increased access to marketing information and knowledge, and improved communication. It is, therefore, recommended that SME owners implement ICT training programmes and workshops that look at the effective use of ICT and explain the costs and negative effects of not using it. SMEs should furthermore, develop a system that encourages employees to provide suggestions on how ICT can be used to improve any aspect within the SMEs daily functional activities.

Future research could be done on more SMEs or different sectors and areas (urban and rural) in South Africa in order to make comparisons.

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