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Information technology innovation and its impact on job creation by SMEs in developing countries: an analysis of the literature review

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ABSTRACT

This study reviews the literature on the role of technology innovation in job creation through small businesses in developing countries. A seven-step approach to the literature review is used for synthesising relevant data. The results show that technology innovations influence employment creation in small businesses positively and act as a driving force for economic development. The effective use of information technology in small businesses has a major impact on their competitiveness and access to international markets. Thus, the need for the government to develop technology innovative strategies for small businesses to actualise their firm performance and enhance job creation is recommended. The findings and proposed theoretical model of the study enrich existing theories and would help policymakers understand the role of information technology innovation in job creation and economic development.

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Employment creation; SME performance; developing countries; ICT

Introduction

Small and medium-sized enterprises (SMEs) have shown their inherent use of ICT competencies in various economic environs (Becheik, landry, and Amara 2006). SMEs contribute meaningfully to socio-economic objectives such as; employment creation, export promotion, entrepreneurship and industrial development (Duncombe 2007; Miroro 2016; Nyeko et al. 2013; Tarutè and Gatautis 2014). There is growing evidence on the importance of SMEs for the socioeconomic growth of developing countries (Hassan and Mohamed 2015; Xiong and Qureshi 2015). Duncombe (2007) and Heeks (2010) state that SMEs contribute to poverty reduction by generating income and providing safer employment opportunities in developing countries through youth and women's empowerment.

It is in this perspective that this study aims to understand the role of information and communications technology (ICT) in job creation in SMEs. The particular choice of SMEs can be explained in by their presence in the industrial fabric of the majority of countries as well as their importance in job creation. Moreover, SMEs are often considered a bastion of innovation (Becheik, landry, and Amara 2006). Innovation activities are also one of the most important factors of international competitiveness, productivity, production, and employment performance of many countries (Lee, Park, and Park 2010).

In recent years, technology innovation has become one of the main concerns of business leaders who want to improve the value of their products/services, penetrate new markets, and increase their

profitability (Barron, Hulten, and Hudson 2012). The review of the literature reveals the complex nature of ICT use in SMEs, given the existence of various internal and external factors whose interactions influence a firm's capability to use ICT (Vainiomaki and Laaksonen 1999). In addition, the European Commission (Eurofound 2016) has stressed that only start-ups that start with innovative products or services can generate employment growth. As a result, it is realised that not all new businesses can create jobs and that innovation is key in generating employment.

Globalisation is rapidly fast-tracking the development of new technologies and new discoveries every day (Joensuu-Salo et al. 2018; Oladimeji, Ebodaghe, and Shobayo 2017). These changes are occurring quickly, and entrepreneurs do not know if they want to update or replace their old technology (Kaplan 2014; Roos and Shroff 2017). The use of ICT is a new approach to modern job creation, with networking sites enabling people to interact through innovation (Chege, Wang, and Suntu 2019; Roztockki and Weistroffer Roland 2011). The digital opportunities offered by ICTs are essential to improve all aspects of developing economies and their entry into new global markets (Apulu and Latham 2010; Azadnia, Zahedi, and Pourabedy 2017).

In spite of extensive development in ICTs, a gap between the use of ICT and SME growth still persists and scholarly research to explain the gap is still limited. For example, a survey conducted by Office for National Statistics (ONS) (2014), displays a visible ICT implementation gap between SMEs and bigger firms. The European Commission on digital Entrepreneurship unearthed similar results emphasising that merely 2% of SMEs take advantage of ICT (European Commission 2015).

Scholars have tried to analyse the reasons for SME averseness to embrace ICT and the failure to derive significant benefits from it (Chege, Wang, and Suntu 2019). However, most of the studies have tended to focus on exigencies between general ICT and its context. For example, Heeks (2010) and Chacko and Harris (2006) conducted extensive research on the use of ICT in SMEs in the Asia Pacific region. Grazzi and Pietrobelli (2016) studied Latin America and the Caribbean, Kadadevaramath et al. (2013) studied India, Miroro (2016) studied Kenya; Esselaar, Stock, and Ndiwalana (2007) studied 13 African countries including Mozambique, South Africa and Tanzania; Nyeko et al. (2013) studied Uganda and Me (2018) studied Nigeria. These studies have shown that the use of phones, especially mobile phones, is very popular among the companies and has yielded positive results (Adera et al. 2014).

While these studies provide useful insights on the use of ICT applications, they appear to concentrate on ICT business uptake with limited focus on other benefits of ICT in employment creation in SMEs. According to the World Employment Social Outlook Trends 2018 (ILO 2018), on a global scale, the North Africa region is characterised by a large gap between youth and women, coupled with high rates of unemployment. In sub-Saharan Africa, this rate is expected to reach 7.2%, which remains essentially unchanged. In Latin America and the Caribbean, the rate decreased marginally, from 8.2% in 2017–7.7% in 2019. In Asia and the Pacific region, fragile jobs affect nearly half of the region's workforce of more than 900 million people. In Central and Western Asia, the number of vulnerable jobs remains high, affecting more than 30% of workers in 2017, but is expected to fall by only 0.6 percentage points by 2019.

Theoretical and empirical studies suggest that the benefits of ICTs are not automatic and that their role in reducing unemployment in SMEs is not yet clear (Adera et al. 2014; Meyer 1988). Little research has been done on the direct and indirect links between the use of ICT in SMEs and employment creation. Overcoming obstacles and finding adequate finances are not the only hindrances for SMEs' success. Growing failure rates in SME start-ups demand that survival be the focus of attention with the use of ICT as an enabler for high success rates for SMEs. This paper endeavours to address this research gap by re-examining the research models that enhance the use of ICT in SMEs (Adera et al. 2014). The article aims to explore the following question: Does the use of ICT in SMEs always contribute to job creation and improved firm performance? The key argument advanced in this article is on the contributory and deterministic view of the use of ICT in SMEs that offers an incomplete representation of ICT in SME job creation. The paper argues that interrogating various assumptions on the use of ICT in SMEs and how it generates employments may enhance understanding of ICT use in SMEs and identify underlying theoretical assumptions to inform future research.

The remaining sections of this paper are organised as follows. The next section deals with the use of ICTs in SMEs and highlights the main factors, benefits, and the conceptual framework, which describes how ICT in SMEs can create jobs and promote overall well-being and challenges thereof. The third section deals with the role of ICT in employment. The fourth section presents the challenges of SMEs, and the job creation strategy. The last section identifies research gaps and recommends future research directions.

Approach to literature review

The paper used the seven-step model postulated by Williams (2018) that is commonly used in a comprehensive literature review. Figure 1 illustrates the logic seven-step model used in the study. The model guided the relevant literature search from the Web of Science and Scopus databases using ICT in SMEs, job creation, and SMEs performance as keywords to identify papers about the impact of ICT on job creation by SMEs. The search was limited to peer-reviewed articles published in English.

The articles were categorised into various groups based on the theme of the articles. According to Tranfield, Denyer and Smart (2003) a good systematic review is based on a well-designed and responsive question. Research questions lead in determining which studies will be included and determine which research strategy should be used to identify relevant research and which to exclude from the paper as shown in Figure 2. Furthermore, the keywords were identified by breaking down the research questions into implicit and explicit components as shown in Table 2.

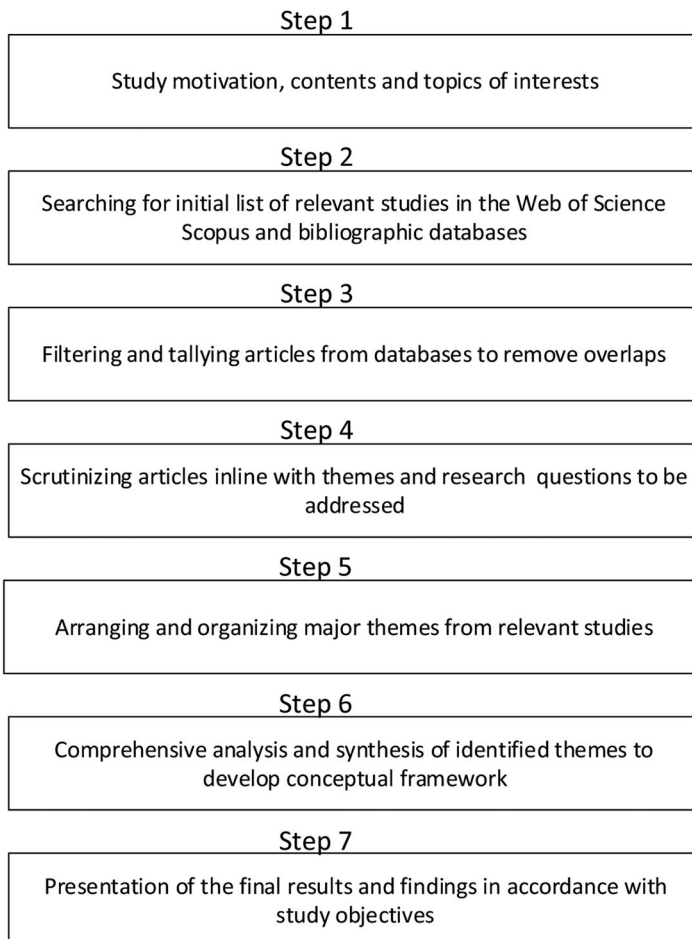


Figure 1. Comprehensive literature review process (Williams 2018).

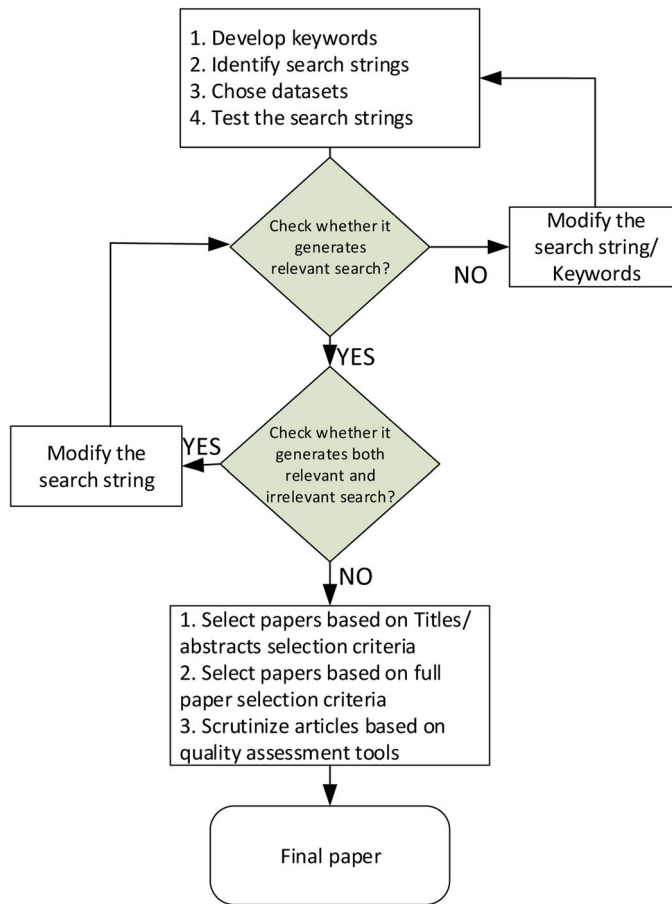


Figure 2. Approach to the literature review.

Importance of SMEs in employment creation

Descriptions of SMEs differ from country to country and are usually based on employment, assets, or a combination of both (Ongori and Migiro 2010). Different countries define SMEs depending on their stages of economic growth. The accepted principles in defining SMEs include staff numbers, investment, and sales volume (Berisha and Pula 2015). However, the definitions are relatively similar and frequently based on the World Bank's definition (Katua 2014).

SMEs are driving the development of the global economy. They are a springboard for industrialisation in both developing and developed economies (Chen 2006). Small businesses comprise 99% of all enterprises in developing countries, signifying their importance (Fjose, Grunfeld, and Green 2010). Furthermore, they account for 52% of the non-governmental employees and 51% of the gross domestic product (GDP) in the US (Longenecker, Carlos, and Petty 2012), while in the UK, they account for 62% of total employment and 25% of GDP (OECD 2018). Like the US and UK, SMEs account for 79% of employment in Italy, for 63% and 60% of employment in France and Germany, respectively. In China, SMEs employ 80% of the urban population, accounting for 60% of the GDP. In sub-Saharan Africa, small businesses comprise more than 95% of all firms (Okello-obura 2011). Notably, SMEs are more important given their role in reducing poverty, increasing national GDP, and creating jobs for the majority of the population (Me 2018). This

Table 1. SMEs Contributions to employment and GDP in developing countries.

Selected Countries	Percentage of GDP Contributions	Percentage of job creation	References
Kenya	40–50%	80%	(Muriithi 2017)
Uganda	18%	90%	(Muriithi 2017; Nyeko et al. 2013)
Tanzania	60%	20%	(Hamisi 2011; Mbuyisa and Leonard 2016; Muriithi 2017)
Ethiopia	3.4%	90%	(Gebrehiwot and Wolday 2006; Muriithi 2017)
South Africa	50–60%	60%	(Muriithi 2017; Ngek 2014; Olawale and Gware 2010)
Ghana	70%	49%	(Abor and Quartey 2010; Oppong, Owiredo, and Churchil 2014; Yeboah 2017)
Nigeria	50%	70%	(Me 2018; Muriithi 2017; Ojukwu 2006)

sector is particularly important because it takes a simple approach to meet the needs of the majority of the African population by providing reasonable prices on goods and services besides being a source of employment (Eurofound 2016; Katua 2014).

SMEs play an important role in addressing national development issues, such as job creation and income generation, as pillars for skills development, poverty alleviation, empowerment, and communities livelihood sustainability (Esselaar, Stock, and Ndiwalana 2007; Makoza and Chigona 2012). SMEs play an important role in the global economy by creating jobs, generating income, and distributing wealth in order to contribute to the socioeconomic development of the community (Katua 2014; Miroro 2016). Table 1 reports the contribution of SMEs to GDP and employment in selected African countries.

Use of ICT in SMEs

This study draws on the different methods and frameworks used in the literature to understand the relationship between ICT innovation and the role of SMEs in job creation. The main components of the conceptual framework for the study are shown in Figure 3, followed by a discussion on each component.

Government support

Helping SMEs get started and grow is a win-win scenario for the government (Muriithi 2017). The government should support ICT use in SMEs (Bankole and Mimbi 2017). In addition, the government

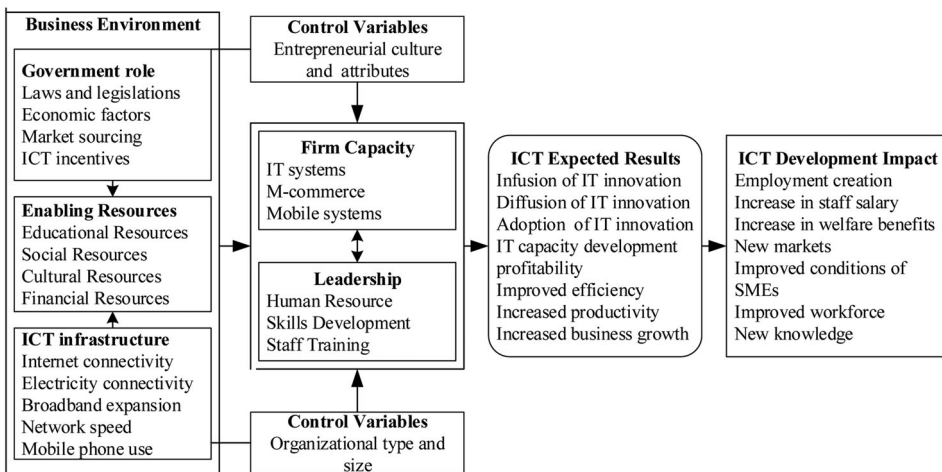


Figure 3. Proposed theoretical model on the use of ICT in SMEs for job creation and economic development.

should improve the infrastructure necessary for the success of the business; this infrastructure support includes construction and maintenance of roads, bridges, railway lines, airports, seaports, transmission lines, and telecommunication systems, all prerequisites for the use of ICTs (Matthews 2007).

ICT infrastructure

ICT infrastructure plays an important role in promoting economic growth, especially in the era of the Internet and mobile communications (Bankole and Mimbi 2017). The infrastructure of ICT is a major growth driver in countries already aware of its importance. Not surprisingly, many developing countries are attempting to internalise ICTs and balance their limited incomes to quickly catch up with advanced economies (Asunka 2016; Bankole and Mimbi 2017; Mbuyisa and Leonard 2016; Miroro 2016). Another policy consideration is that rural electrification, which is a key variable, especially for rural SMEs (Bankole and Mimbi 2017).

Enabling resources

Entrepreneurial training is key to the growth strategy of SMEs (Kamunge, Njeru, and Tirimba 2014). In this respect, policies that support the development of SMEs, and enable them to attract and retain skilled personnel both within and across the border are essential for promoting growth. These approaches, such as funding, empowerment, and use of technology by SMEs are critical.

Management structure and leadership

The full provision of economic leadership skills is thought to promote economic growth and job creation through its key role in identifying and leveraging innovation opportunities. Leadership skills include the ability to enable individuals to initiate and lead ICT-related innovations at all levels of the enterprise, from new businesses to the larger ones, from the private to the public (Chege, Wang, and Suntu 2019; Roztocky and Weistroffer Roland 2011).

Benefits of technology in SMEs

Technology innovation is understood as an approach that provides a competitive edge to the firm through market diversification and new commercial opportunities (Schumpeter 1942).

Over the years, extensive theoretical and empirical research on the use of ICT in SMEs has been conducted, covering various areas, especially ICT implementation (Ismail, Jeffery, and Belle 2011; Ongori and Migiro 2010; Xiong and Qureshi 2015). Other studies have analysed the benefits of adopting and using ICT (Esselaar, Stock, and Ndiwalana 2007; Me 2018; Oladele 2015). Jasinski (2009) explored the barriers to ICT adoption and use, whereas Chacko and Harris (2006) described the contribution of ICTs to economic growth. Research by Chen and Kamal (2016), Duncombe (2007); Ntwoku, Negash, and Meso (2017); Makoza and Chigona (2012) explored the impact of ICT use on the livelihoods of rural SMEs.

Apulu and Latham (2010) observed that the information technology revolution has created many opportunities and challenges for many organisations. As a result, managers must learn to adapt and maximise the benefits of ICT while protecting themselves from their associated threats (Brynjolfsson and Saunders 2010). Technology has levelled the competitive environment (Me 2018), where a world without computers, mobile phones, and the Internet is inconceivable (AlBar and Hoque 2017), as information technology has brought buyers and sellers together (Chung and Wang 2004). Table 2 shows key themes on the use of ICT in SMEs and its impact on economic development.

Table 2. Research questions and related studies.

Key themes	Research question	Selected empirical studies	Reference
Use ICT by SMEs to improve performance: benefits, barriers, and strategies to address the barriers in developing countries.	What is the role of ICTs in SMEs performance?	<ul style="list-style-type: none"> - Role of ICT in enhancing organisational performance: The catalysing effect of corporate entrepreneurship - The Role of ICT within SMEs in Gauteng - The role of ICT within SMEs in job creation in Kampala, Uganda - ICT Usage and Its Impact on Profitability of SMEs in 13 African Countries - ICT, Innovation and Firm Performance 	(Duncombe 2007; Esselaar, Stock, and Ndiwalana 2007; Gerguri-Rashiti et al. 2017; Heeks 2010; Mbuyisa and Leonard 2016; Modimogale and Kroeze 2011; Nyeko et al. 2013; Yunis, Tarhini, and Kassar 2018)
	What are the benefits of ICT adoption to SMEs? What are the barriers to ICT adoption experienced by SMEs?	<ul style="list-style-type: none"> - ICT adoption in Cameroon SME: application of the Bass diffusion model - Benefits of ICT in SMEs: a case study of a Nigerian SME - Drivers and challenges of ICT adoption by SMEs in Accra metropolis, Ghana - Factors affecting the adoption of ICT in SMEs: a perspective from rural Saudi Arabia - ICT adoption in SMEs: a literature review - African SMEs contributions, challenges, and solutions 	(Agboh 2015; AlBar and Hoque 2017; Apulu and Latham 2010; Muriithi 2017; Shittu, Omotayo, and Adekola 2016; Ntwoku, Negash, and Meso 2017; Ongori and Migiro 2010)
	To what extent do SMEs have access and use of ICTs?	<ul style="list-style-type: none"> - Enhancing market access in Kenyan SMEs using ICT - Using ICT as a Value Adding Tool in South African SMEs 	(Ismail, Jeffery, and Belle 2011; Kiveu and Ofafa 2013)
Use of ICT in SMEs and job creation: The influence of ICT on job creation in developing countries.	How do ICTs use in SMEs contribute to socioeconomic development in developing countries?	<ul style="list-style-type: none"> - The livelihood outcomes of ICT use in microenterprises: the case of South Africa - Information Technology for Development in SMEs - ICTs and Development: Nature of Mobile Phones usage for SMEs Economic Development - An Exploratory Study in Morogoro, Tanzania - Impact of ICT-enabled product and process innovations at the Bottom of the Pyramid 	(Duncombe 2007; Heeks 2010; Melchioly and Sæbø 2010; Tarafdar, Singh, and Anekal 2013; Xiong and Qureshi 2015)
	How can ICTs contribute to job creation?	<ul style="list-style-type: none"> - The role of ICT within SMEs in job creation in Kampala, Uganda - ICT and job creation in Kenya 	(Adera et al. 2014; Eurofound 2016; Katua 2014; Mbuyisa and Leonard 2016; Miroro 2016; Nyeko et al. 2013)

(Continued)

Table 2. Continued.

Key themes	Research question	Selected empirical studies	Reference
		<ul style="list-style-type: none"> - ICT Pathways to Poverty Reduction Empirical evidence from - East and Southern Africa - The role of ICT use in SMEs towards poverty reduction: a systematic literature review - SMES and decent and productive employment creation - Job creation in SMEs: ERM annual report 2015 - The Role of SMEs in Employment Creation and Economic Growth in Selected Countries 	

Use of ICT in SMEs performance and employment

ICT plays a key role in economic development in many developing countries (Akinwale, Adepoju, and Olomu 2017; Delponte et al. 2015). The adoption of information technology in business processes has improved the overall operational efficiency of the company (Olusola and Oluwaseun 2013). Several scholars have examined the use of ICT by SMEs, such as case studies conducted by Shiels, Mclvor, and O'Reilly (2003) in Northern Ireland. The study found that the characteristics of the commercial and industrial sectors help SMEs to adopt and use ICTs to support business processes. Frempong (2007) and Agboh (2015) found that the use of ICT by SMEs is related to the growth of enterprises in Ghana. Informal SMEs largely use mobile phones, while other services, such as the Internet, are used by formal SMEs for commercial reasons, such as cost efficiency and business transactions (Asunka 2016; Frempong 2007).

Specific advantages of ICT use in SMEs

New markets access

SMEs in developed and developing countries share a common interest in making their activities more efficient, profitable, and sustainable (Kiveu and Ofafa 2013). Globalisation offers SMEs the opportunity to participate in regional and international markets through the use of ICT (Ongori and Migiro 2010). It enhances market expansion potential (OECD 2018; Ojukwu 2006; Ramsey and Mccole 2005), reduces transaction costs (Asunka 2016), increases choice for buyers (Yilmaz and Ayci 2016), and improves price transparency (Heeks 2010).

Increased firm profitability

The use of ICTs can increase the efficiency of SMEs by reducing costs and expanding the market. The impact of these factors on individual SMEs translates into positive outcomes for job creation, income generation, and overall national competitiveness (Ongori and Migiro 2010). The results of the study show that investment in ICT has no significant impact on SMEs. ICT has positively contributed to the turnover of SMEs in the formal categories, thus creating employment (Esselaar, Stock, and Ndiwalana 2007).

Improved Labour productivity

ICT plays an important role in improving the productivity of work and the efficiency of certain organisational functions by facilitating the automation of business processes. It can also facilitate the transfer of knowledge among team members, and support the creation of knowledge in specific areas

(Ongori and Migiro 2010). Premkumar and Roberts (1999) stated that ICTs promote teamwork by stimulating and accelerating knowledge transfer. Esselaar, Stock, and Ndiwalana (2007) found that ICT use increased the productivity of SMEs in a sample of 13 African countries. Muriithi (2017) explored the impact of ICT on the micro-competitiveness of SMEs in Kenya.

Challenges facing ICT use by SMEs in developing countries

Barriers to ICT use by SMEs in developing countries include high cost of access to telecommunications, lack of government ICT policy, use of obsolete technologies, lack of skilled and well-trained human resources, poor communication infrastructure, high cost ICT equipment, and resistance to change (Ismail, Jeffery, and Belle 2011; Xiong and Qureshi 2015). SMEs operating in Africa face many challenges that hinder their development (Bunyasi, Bwisa, and Namusonge 2014). This is supported by Kamunge, Njeru, and Tirimba (2014) who found that, in addition to positive development effects, SMEs face many obstacles that limit their long-term survival (Table 3). The rate of business failures is worrying, with only a few companies surviving for months to a year (Bunyasi, Bwisa, and Namusonge 2014).

Strategies to create jobs via use of ICT in SMEs

The importance of SMEs in the economy cannot be underestimated. In fact, policymakers around the world, in both developed and developing countries, now view SMEs as a source of jobs, wealth creation, and innovation (Nieman, Hough, and Nieuwenhuizen 2003). The sector is also a major source of manufactured goods and services for export and domestic consumption. While various SME-related challenges and solutions in Africa have been examined, a study by Benzing, Chu, and Kara (2009) in Turkey revealed that the most important factors associated with the success of SMEs are non-managerial features such as honesty and integrity, company reputation, customer focus, and the provision of quality products at competitive prices. However, African countries need to develop policy and regulatory frameworks that promote and encourage the development and growth of SMEs (Muriithi 2017).

Developing a good strategy for SMEs is critical to job creation and GDP, which is a priority for any government (Mbuyisa and Leonard 2016). Because of the enthusiasm generated by the potential contribution of ICTs to job creation, interventions to leverage ICT are summarised below:

1. Training and development to increase the employability and ability of young people to start their own ICT business: Training reduces the mismatch between the available work and the skills and abilities of the job seeker (Mbuyisa and Leonard 2016).
2. Incubators and technological centres that can provide incubation services such as workspaces and business support services for start-ups with ICT components should be strengthened. Education institutions and research universities should set up business incubators focused on many areas of ICT innovation. Establishment of ICT infrastructure and stop centres to share information on job creation opportunities could significantly contribute to job creation (World Bank Group 2017).
3. Initiate business startups using online job search platforms such as ICT-enabled agricultural entrepreneurs who use ICTs to improve information, finance, and market access in agricultural value chains. This enables SMEs to access international market and information relevant to their businesses (Ismail, Jeffery, and Belle 2011; Kamunge, Njeru, and Tirimba 2014; Kiveu and Ofafa 2013).
4. Create awareness of digital jobs opportunities among the youth through the use of social media, local content projects, business process outsourcing, and one-stop shops. Promote an information technology innovation ecosystem of incubators and accelerators. This could create more jobs through the provision of sustainable investment and by working with all stakeholders (Muriithi 2017)
5. Promote innovation in the agriculture and manufacturing sectors through market diversification to create jobs (Asunka 2016)

Table 3. SMEs' challenges and proposed interventions in developing countries.

s/n.	Challenge	Proposed Interventions	Expected outcomes/ impact	Reference
1	Access to financing	<ul style="list-style-type: none"> - Budgets for loans, grants, and guarantees - Train and advise financial intermediaries on how to roll out new financial products and on how to adapt existing products to suit SMEs - Provide Loans to start-ups and SMEs, and avail other financial products flexible to SMEs 	<ul style="list-style-type: none"> - Establishment of new start-ups - Improved Performance of existing SMEs - Increased employment - Economic empowerment of women and youths 	(Shittu, Omotayo, and Adekola 2016; Fjose, Grunfeld, and Green 2010; ILO 2018; Shah et al. 2013)
2	Competency and capability	<ul style="list-style-type: none"> - Budget for entrepreneurial training - Train, advise and certify local training providers on how to deliver training - Develop Co-fund training MoUs 	<ul style="list-style-type: none"> - Improved Management skills in SMEs - Risk-taking in start-ups establishment - Improved Performance of existing SMEs - Increased employment - Economic empowerment of women and youths 	(Fatoki 2014; Muriithi 2017)
3	Access to reliable information and value chain management	<ul style="list-style-type: none"> - Analyse SMEs value chain and identify underlying constraints in the market system - Develop the capacity for market actors via information access (mobile phone applications) - Select appropriate SMEs market value chain ecosystem and train personnel 	<ul style="list-style-type: none"> - Newmarket development - Increased SMEs competitiveness in the market - Improved capacity to deliver service to the new market - Increased sales/income - Improved employment 	(Ismail, Jeffery, and Belle 2011; Kamunge, Njeru, and Tirimba 2014; Kiveu and Ofafa 2013)
4	Working conditions and Electricity supply	<ul style="list-style-type: none"> - Advise governments on how to embed new services in SMEs programmes - Propose public-private partnerships to multinational enterprises as incubators for SMEs - Conduct pilots study and set up networks hubs SMEs 	<ul style="list-style-type: none"> - Training and incubation guidelines on modern management practices and improved working conditions delivered to SMEs - Enterprise Improvement Plans available - Connectivity and feedback system provided to SMEs - Improved physical workplace conditions - Improved quality and Productivity - Reduced waste and energy consumption - Improved quality of employment 	(Fjose, Grunfeld, and Green 2010; Forkuoh and Li 2015; Olawale and Gware 2010)
6	Licensing and enterprise formalisation- Government support	<ul style="list-style-type: none"> - Collect and analyse data on dimensions and causes of SMEs informality - Provide policy advice on how to streamline business registration, simplify taxation and create incentives for SMEs formalisation 	<ul style="list-style-type: none"> - Simplified business registration - Simplified tax admiration/ reduced rates for SMEs - Reduced red tape via one stop shop - Reformed inspection services - Increased access to finance and non-financial services - Increased income 	(Beck and Cull 2014; Kamunge, Njeru, and Tirimba 2014; Mbuyisa and Leonard 2016; Muriithi 2017)

(Continued)

Table 3. Continued.

s/n.	Challenge	Proposed Interventions	Expected outcomes/ impact	Reference
		- Organize formalisation campaigns and training	- Increased employment	
7	Stiff competition in business environment	- Collect and analyse data on the business environment - Provide policy advice on how to streamline, simplify or revise regulations - Expand social dialogue to issues concerning the enabling environment	- Public authorities strengthened - Improved capacity of stakeholders for evidence-based dialogue - Reduced business costs and risks, and increased competition - Increased profit and investments - Increased productivity and competitiveness	(Criscuolo, Gal, and Menon 2014; Kamunge, Njeru, and Tirimba 2014)

Summary and Conclusions

How does the use of ICT in SMEs promote employment creation?

Several key issues emerged in this review. Specialists and practitioners have paid much attention to the use of ICT, but the job creation potential of SMEs has not been fully explored. Research is fragmented and diverse. Therefore, the generalisation of the results is difficult. Much of the research on use of ICT in SMEs is based on quantitative methods. Most data collection in quantitative studies relies on survey data (Dodgson, Gann, and Salter 2006). Thus, the purpose of this study was to examine whether the use of ICT can lead to job creation for SMEs in developing countries. As confirmed herein, SMEs account for more than 50% of the GDP and, on average, 60% of employment in most developing countries (Asunka 2016; Miroro 2016; Muriithi 2017; Ojukwu 2006).

Innovative firms drive technological progress. Though they are not superior systems to maximise economic development (Consoli 2012), they are efficient learning organisations that seize technological and market opportunities creatively in order to expand production frontiers (Gupta, Guha, and Krishnaswami 2013). The finding reveals that firms that innovate more consistently and rapidly employ more workers, demand higher skills, pay higher wages, and offer more stable prospects for their workforce (Asunka 2016).

Use of ICT is an essential element of business success in today's dynamic markets (Yunis, Tarhini, and Kassar 2018). The theoretical study of Heeks (2010) focused on the socioeconomic impact of ICT in developing countries, including skills, attitudes, and knowledge. The empirical studies found the use of ICTs by SMEs impacts livelihoods and reduce vulnerabilities (Duncombe 2007; Makoza and Chigona 2012). Limited information was found on the use of ICTs to acquire human resources (Adera et al. 2014; Makoza and Chigona 2012).

In terms of the measure of job creation, the empirical studies conducted on the impact of mobile phones explored the benefits to SMEs from an economic perspective; the social impact was not explored (Miroro 2016; Muriithi 2017). The study conducted by Adera et al. (2014) on SMEs in Tanzania examined the impact of ICT use on financial resources, social services, the human capacity to use ICT, and changes in vulnerabilities. The opportunity to apply ICT innovatively to create jobs in most developing countries does exist (Matthews 2007).

Study implications

The results of the review on the relationship between use of ICT and job creation in SMEs indicate that their use can increase productivity, generate revenue, enhance internal efficiency, and facilitate international linkages. SMEs face many challenges that prevent them from adopting ICT in their business processes. These challenges include lack of funding, high costs of ICT, lack of awareness of the benefits of ICT,

and security considerations (Tarutè and Gatautis 2014). Various strategies have been proposed in the literature to reduce barriers to ICT adoption, such as government grants and SME support programmes as well as interventions to encourage the use of ICT by SMEs (Xiong and Qureshi 2015).

SMEs in most developing countries seldom receive attention and lack the appropriate ICT infrastructure to encourage such development. Nevertheless, by handling the issues of electricity shortages, access to funds, inadequate management skills and capacity, lack of information, lack of public support, and widespread corruption, SMEs can put developing countries on the map of development and innovation (Asunka 2016). ICT can help improve the conditions of SMEs by strengthening human capital, improving knowledge and skills, increasing incomes, and reducing vulnerability (Miroro 2016). It is through the active role of SMEs that developing countries can transform their economic status, and position themselves as strong competitors in the international market (Muriithi 2017). The African continent is rich in minerals, agriculture, and human resources; it can thus overcome ICT-related challenges (Bankole and Mimbi 2017). The results of this literature review are consistent with other findings on the socioeconomic impacts of using ICTs by SMEs because of their critical role in employment. As noted earlier, empirical studies have shown that the use of ICTs can improve employment through SMEs.

Given the qualitative information contained in the literature reviewed as part of this study, employment opportunities created by SMEs appear to be influenced by a combination of factors. Some of these factors that promote or hinder SME employment growth relate to the operating environment in the study conceptual framework (Figure 3). The limitation of this study is that discussions on strategies of using ICT in SMEs to create employment are limited in the current literature. Although this work addresses the issue of job creation in SMEs, it is important to explore the issue of employment creation by SMEs through outsourcing or cooperation between SMEs to generate self-employment. Similarly, inter-SME job creation deserves further consideration, as it is widely accepted that clusters or inter-sectoral relationships are linked to SME development. In addition, policymakers may pay more attention to newly emerging forms of employment, such as workforce sharing, in which the human resource needs of many firms are combined to establish a permanent working relationship between an employee and a group of employers. This form of employment can be seen as a tool for SMEs to create jobs and a win-win strategy for workers and employers (Eurofound 2016).

Finally, ICT is an important tool that can positively impact growth and competitiveness if effectively deployed by SMEs. Therefore, it is important to ensure that the SMEs sector has a specific authority to implement national policies and provide ICT infrastructure needed by SMEs. In practical terms, this study found that while ICTs bring many benefits to SMEs through various applications, its implementation challenge limits these benefits. Therefore, ICT policymakers and support programmes should promote use of ICT in SMEs to support job creation and economic development. Governments should not only improve access to ICT but also develop policies that encourage the development of the skills and capabilities of SMEs' owner-managers and employees. Academicians should provide adequate training that will enable SMEs to use ICT as an engine for generating employment and economic growth through global markets access.

Disclosure statement

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References

- Abor, J., and P. Quartey. 2010. "Issues in SME Development in Ghana and South Africa." *International Research Journal of Finance and Economics* 39: 218–228.
- Adera, E., T. Waema, J. May, O. Mascarenhas, and K. Diga. 2014. *ICT Pathways to Poverty Reduction: Empirical Evidence From East and Southern Africa*. Practical Action Publishing. doi:10.1360/zd-2013-43-6-1064.
- Agboh, D. K. 2015. "Drivers and Challenges of ICT Adoption by SMEs in Accra Metropolis, Ghana." *Technology Research* 6: 1–16.
- Akinwale, Y. O., O. O. Adepoju, and M. O. Olomu. 2017. "The Impact of Technological Innovation on SME 's Profitability in Nigeria." *International Journal of Research, Innovation and Commercialization* 1 (1): 74–92.
- AlBar, A. M., and M. R. Hoque. 2017. "Factors Affecting the Adoption of Information and Communication Technology in Small and Medium Enterprises: a Perspective From Rural Saudi Arabia." *Information Technology for Development*, 1–24. doi:10.1080/02681102.2017.1390437.
- Apulu, I., and A. Latham. 2010. Benefits of Information and Communication Technology in Small and Medium Sized Enterprises: A Case Study of a Nigerian SME. *UK Academy for information systems Conference proceedings* (Vol. 3).
- Asunka, B. A. 2016. "The Significance of Information and Communication Technology for SMEs in Rural Communities." *Journal of Small Business and Entrepreneurship Development* 4 (2): 29–38. doi:10.15640/jsbed.v4n2a4.
- Azadnia, M., S. Zahedi, and M. R. Pourabedy. 2017. "Analysis of the Impact of ICT on Sustainable Development Using Sustainability Indicators." *International Journal of Computer Applications* 169 (6): 13–24. <https://pdfs.semanticscholar.org/d30f/f2717b122b2642e64e282bf526f56599e.pdf>.
- Bankole, F. O., and L. Mimbi. 2017. "ICT Infrastructure and It's Impact on National Development: A Research Direction for Africa." *The African Journal of Information Systems* 9 (2): 77.
- Barron, A., P. Hulten, and S. Hudson. 2012. "The Financial Crisis and Gathering of Political Intelligence: A Cross Cutting Comparison of SMEs in France, Sweden and UK." *International Small Business Journal* 4 (30): 345–366.
- Becheik, N., R. Landry, and N. Amara. 2006. "Lessons from Innovation Empirical Studies in the Manufacturing Sector: A Systematic Review of the Literature from 1993–2003." *Technovation* 5-6 (26): 644–664.
- Beck, T., and R. Cull. 2014. *Small- and Medium-sized Enterprise Finance in Africa: Africa Growth Initiative* (No. 16).
- Benzing, C., M. H. Chu, and O. Kara. 2009. "Entrepreneurs in Turkey: A Factor Analysis of Motivations, Success Factors and Problems." *Journal of Small Business Management* 1 (47): 58–91.
- Berisha, G., and J. S. Pula. 2015. "Defining Small and Medium Enterprises : a Critical Review." *Academic Journal of Business, Administration, Law and Social Sciences* 1 (March): 16–28.
- Brynjolfsson, E., and A. Saunders. 2010. *Wired for Innovation: How Information Technology is Reshaping the Economy*. London: The MIT Press. Cambridge Massachusetts.
- Bunyasi, G. N. W., H. Bwisa, and G. Namusonge. 2014. "Effect of Access to Business Information on the Growth of Small and Medium Enterprises in Kenya." *International Journal of Business and Social Science* 5 (10): 121–128.
- Chacko, J. G., and G. Harris. 2006. "Information and Communication Technology and Small, Medium, and Micro Enterprises in Asia-Pacific—Size Does Matter." *Information Technology for Development* 12 (2): 175–177. doi:10.1002/itdj.
- Chege, S. M., D. Wang, and S. L. Suntu. 2019. "Impact of Information Technology Innovation on Firm Performance in Kenya." *Information Technology for Development*, 1–30. doi:10.1080/02681102.2019.1573717.
- Chen, J. 2006. "Development of Chinese Small and Medium-Sized Enterprises." *Journal of Small Business and Enterprise Development* 13 (2): 140–147. doi:10.1108/14626000610665854.
- Chen, W., and F. Kamal. 2016. *The Impact of Information and Communication Technology Adoption on Multinational Firm Boundary Decisions* (CES No. CES 16-01). Washington, DC 20233.
- Chung, Y., and W. Wang. 2004. "The Levels of Information Technology Adoption, Business Network and a Strategic Position Model for Evaluating Supply Chain." *Journal of Electronic Commerce Research* 2 (5): 55–98.
- Consoli, D. 2012. "Literature Analysis on Determinant Factors and the Impact of ICT in SMEs." *Procedia - Social and Behavioral Sciences* 62: 93–97. doi:10.1016/J.SBSPRO.2012.09.016.
- Criscuolo, C., P. N. Gal, and C. Menon. 2014. *The Dynamics of Employment Growth : New Evidence From 18 Countries* (CEP Discussion Paper No. 1274). Paris: OECD Publishing.
- Delponte, L., M. Grigolini, A. Moroni, and S. Vignetti. 2015. *ICT in the Developing World*. Brussels. doi:10.2861/52304
- Dodgson, M., D. Gann, and A. Salter. 2006. "The Role of Technology in the Shift Towards Open Innovation: The Case of Procter & Gamble." *R&D Management* 36 (3): 333–346.

- Duncombe, R. 2007. "Using the Livelihoods Framework to Analyze ICT Applications for Poverty Reduction Through Microenterprise." *Information Technologies and International Development* 3 (3): 81–100. doi:10.1162/itid.2007.3.3.81.
- Esselaar, S., C. Stock, and A. Ndiwalana. 2007. "ICT Usage and its Impact on Profitability of SMEs in 13 African Countries." *The Journal of Information Technologies and International Development* 1 (4): 87–100.
- Eurofound, E. F. for the I. of L. and W. C. 2016. *Job Creation in SMEs: ERM Annual Report 2015*. Luxembourg.
- European Commission. 2015. Digital Entrepreneurship Monitor. <https://ec.europa.eu/growth/tools-databases/dem/monitor/statistics#/home>.
- Fatoki, O. 2014. "The Causes of the Failure of New Small and Medium Enterprises in South Africa." *Mediterranean Journal of Social Sciences* 5 (20): 922–927. doi:10.5901/mjss.2014.v5n20p922.
- Fjose, S., L. A. Grunfeld, and C. Green. 2010. "SMEs and Growth in Sub-Sahara Africa: Identifying SME Role and Obstacles to SME Growth." *MENON-Publication* 14: 1–28.
- Forkuoh, S. K., and Y. Li. 2015. "Electricity Power Insecurity and SMEs Growth: A Case Study of the Cold Store Operations in the Asafo Market Area of Kumasi Metro in Ghana." *Open Journal of Business and Management* 7 (3): 312–325.
- Frempong, G. 2007. "Trends in ICT Usage by Small and Medium Scale Enterprises in Ghana." *ATDF Journal* 4 (1): 3–10.
- Gebrehiwot, A., and A. Wolday. 2006. "Micro and Small Enterprises (MSE) Development in Ethiopia: Strategy, Regulatory Changes and Remaining Constraints." *Ethiopian Journal of Economics* 10 (2): 1–32.
- Gërguri-Rashiti, S., V. Ramadani, H. Abazi-Alili, L. P. Dana, and V. Ratten. 2017. "ICT, Innovation and Firm Performance: The Transition Economies Context." *Thunderbird International Business Review* 59 (1): 93–102. doi:10.1002/tie.21772.
- Grazzi, M., and C. Pietrobelli. 2016. "Firm Innovation and Productivity in Latin America and Caribbean: Engine of Economic Development." *Inter-American Development Bank*. doi:10.1057/978-1-349-58151-1.
- Gupta, P., S. Guha, and S. Krishnaswami. 2013. "Firm Growth and its Determinants." *Journal of Innovation and Entrepreneurship* 1 (2): 1–15.
- Hamisi, S. 2011. "Challenges and Opportunities of Tanzanian SMEs in Adapting Supply Chain Management." *African Journal of Business Management* 5 (4): 1266–1276. doi:10.5897/AJBM10.704.
- Hassan, B., and B. Mohamed. 2015. "Firm Innovation and Social Development: Case of Terroir Products in Souss Massa Draa Region (Morocco)." *Advances in Economics and Business* 3 (8): 340–347. doi:10.13189/aeb.2015.030807.
- Heeks, R. 2010. "Do Information and Communication Technologies (ICTs) Contribute to Development?" *Journal of International Development* 22: 625–640. doi:10.1002/jid.
- International labor organization (ILO). 2018. *World Employment Social Trends 2018*. Geneva: ILO.
- Ismail, R., R. Jeffery, and J.-P. Belle. 2011. "Using ICT as a Value Adding Tool in South African SMEs." *Journal of African Research in Business & Technology* (January 2011): 1–12. doi:10.5171/2011.470652.
- Jasinski, A. H. 2009. "Barriers for Technology Transfer: the Case of a Country in Transition." *Journal of Technology Management in China* 4 (2): 119–131. doi:10.1108/17468770910964984.
- Joensuu-Salo, S., K. Sorama, A. Viljamaa, and E. Varamäki. 2018. "Firm Performance among Internationalized SMEs: The Interplay of Market Orientation, Marketing Capability and Digitalization." *Administrative Sciences* 8 (3): 31. doi:10.3390/admsci8030031.
- Kadavearamath, R. S., J. C. Chen, M. Sangli, R. K. Ra, and H. Vardhan. 2013. "A Study on Implementation of IT Tools in SME'S in India." *Industrial Engineering & Management* 03 (04), doi:10.4172/2169-0316.1000135.
- Kamunge, M. S., A. Njeru, and O. I. Tirimba. 2014. "Factors Affecting the Performance of Small and Micro Enterprises in Limuru Town Market of Kiambu County." *Kenya. International Journal of Scientific and Research Publications* 4: 12.
- Kaplan, D. M. 2014. "Technology and Globalization." *A Companion to the Philosophy of Technology*, 325–328. doi:10.1002/9781444310795.ch56.
- Katua, N. T. 2014. "The Role of SMEs in Employment Creation and Economic Growth in Selected Countries." *International Journal of Education and Research* 2 (12): 461–472.
- Kiveu, M., and G. Ofafa. 2013. "Enhancing Market Access in Kenyan SMEs Using ICT." *Journal of Global Business and Economics Research* 2 (9): 29–46. doi:10.1016/S0013-4686(02)00487-5.
- Lee, S., G. Park, and L. Park. 2010. "Open Innovation in SMEs—An Intermediated Network Model." *Research Policy* 39 (2): 290–300.
- Longenecker, J. G., W. N. Carlos, and J. W. Petty. 2012. *Small Business Management: An Entrepreneurial Emphasis*. Mason, OH: Thompson South-Western
- Makoza, F., and W. Chigona. 2012. "The Livelihood Outcomes of ICT Use in Microenterprises: The Case of South Africa." *EJISDC* 53 (1): 1–16.
- Matthews, P. 2007. "ICT Assimilation and SMEs Expansion." *Journal of International Development* 19 (6): 817–827.
- Mbuyisa, B., and A. Leonard. 2016. "The Role of ICT use in SMEs Towards Poverty Reduction: A Systematic Literature Review." *Journal of International Development* 1–39. doi:10.1002/jid.
- Me, A. 2018. "Relevance of Information Technology in the Effective Management of Selected SMEs in Lagos State Nigeria." *Academy of Strategic Management Journal* 1 (17): 1–15.
- Melchioly, S. R., and Ø. Sæbø. 2010. "ICTs and Development: Nature of Mobile Phones Usage for SMEs Economic Development - An Exploratory Study in Morogoro, Tanzania." *ICT and Development - Research Voices From Africa* (March): 1–13.

- Meyer, P. B. 1988. "Combining New Job Creation with Advanced Technology Adoptions: British Innovative Local Economic Efforts British Innovative Local Economic Efforts." *Journal of Economic Issues* 22 (2): 443–449. doi:10.1080/00213624.1988.11504774.
- Miroro, O. O. 2016. Information and Communication Technologies and Job Creation in Kenya (September 2016), 2. <http://includeplatform.net/wp-content/uploads/2016/09/ICTs-Job-creation-Kenya.pdf>.
- Modimogale, L., and J. H. Kroeze. 2011. "The Role of ICT Within Small and Medium Enterprises in Gauteng." *IBIMA Publishing* 2011: 1–12. doi:10.5171/2011.
- Muriithi, S. 2017. "African Small and Medium Enterprises (Smes) Contributions, Challenges and Solutions." *European Journal of Research and Reflection in Management Science* 5 (1): 1–14.
- Ngeke, N. B. 2014. "Determining High Quality SMEs That Significantly Contribute to SME Growth: Regional Evidence From South Africa." *Problems and Perspectives in Management* 12 (4): 1–13.
- Nieman, G., J. Hough, and C. Nieuwenhuizen. 2003. *Entrepreneurship: A South African Perspective*. Pretoria: Van Schaik.
- Ntwoku, H., S. Negash, and P. Meso. 2017. "ICT Adoption in Cameroon SME: Application of Bass Diffusion Model." *Information Technology for Development* 23 (2): 296–317. doi:10.1080/02681102.2017.1289884.
- Nyeko, S., E. Kabaale, M. Moya, C. Amulen, and G. M. Kituyi. 2013. "The Role of Information Communication Technology (ICT) Small and Medium Enterprises (SMEs) in job Creation in Kampala, Uganda." *Journal of Business Management and Administration* 1 (5): 75–82.
- OECD. 2018. Enabling SMEs to Scale up- Ministerial Conference in Mexico
- Office for National Statistics (ONS). 2014. Measuring e-commerce. <http://www.ons.gov.uk/ons/rel/rdit2/measuring-e-commerce/2014/art-indicators.html>.
- Ojukwu, D. 2006. "Achieving Sustainable Growth Through the Adoption of Integrated Business and Journal of Information Technology Impact." *Journal of Information Technology Impact* 6 (1): 47–60.
- Okello-obura, C. 2011. "Utilisation of ICTs by SMEs in Records and Information Management in Uganda: A Baseline Study." *Journal of South African Society Archivists* 44 (2011): 43–61.
- Oladele, O. 2015. "Effect of Information Communication Technology (ICT) on Agriculture Information Access among Extension Officers in North West Province South Africa." *South Africa Journal of Agricultural Extension* 2 (43): 30–41.
- Oladimeji, M. S., A. T. Ebodaghe, and P. B. Shobayo. 2017. "Effect of Globalization on Small and Medium Enterprises (SMEs) Performance in Nigeria." *International Journal of Entrepreneurial Knowledge* 5 (2): 56–65. doi:10.1515/ijek-2017-0011.
- Olawale, P., and D. Gware. 2010. "Obstacles of Growth of New SMEs in South Africa: A Principal Component Analysis Approach." *African Journal of Business Management* 4 (5): 729–738.
- Olusola, A., and Y. Oluwaseun. 2013. "An Appraisal of the Impact of Information Technology (IT) on Nigeria Small and Medium Enterprises (SMEs) Performance." *International Journal of Academic Research in Management (IJARM)* 2 (4): 140–152.
- Ongori, H., and S. O. Migiro. 2010. "Information and Communication Technologies Adoption in SMEs: Literature Review." *Journal of Chinese Entrepreneurship* 2 (1): 93–104.
- Opong, M., A. Owiredo, and R. Q. Churchill. 2014. "Micro and Small Scale Enterprises Development in Ghana." *European Journal of Accounting Auditing and Finance Research* 2 (6): 84–97.
- Premkumar, G., and M. Roberts. 1999. "Adoption of New Information Technologies in Rural Small Businesses." *Omega* 27 (4): 467–484. doi:10.1016/S0305-0483(98)00071-1.
- Ramsey, E., and P. Mccole. 2005. "E-Business in Professional SMEs: the Case of New Zealand." *Journal of Small Business and Enterprise Development* 12 (4): 528–544.
- Roos, G., and Z. Shroff. 2017. "What Will Happen to the Jobs? Technology-Enabled Productivity Improvement – Good for Some, bad for Others." *Labour & Industry: A Journal of the Social and Economic Relations of Work* 27 (3): 165–192. doi:10.1080/10301763.2017.1359817.
- Roztocki, N., and H. Weistroffer Roland. 2011. "Information Technology Success Factors and Models in Developing and Emerging Economies." *Information Technology for Development* 17 (3): 163–167.
- Schumpeter, J. A. 1942. *Capitalism, Socialism, and Democracy*. (Harper Col). New York: Harper and Brothers.
- Shah, S. F. H., T. Nazir, K. Zaman, and M. Shabir. 2013. "Factors Affecting the Growth of Enterprises: A Survey of the Literature From the Perspective of Small- and Medium-Sized Enterprises." *Journal of Enterprise Transformation* 3 (2): 53–75. doi:10.1080/19488289.2011.650282.
- Shiels, H., R. Mclvor, and D. O'Reilly. 2003. "Understanding the Implications of ICT Adoption: Insights From SMEs." *Logistics Information Management* 16 (5): 312–326.
- Shittu, K., A. Omotayo, and A. Adekola. 2016. "Challenges Facing the Adoption of Information Technology in the Management of Small and Medium Enterprises in Nigeria." *International Journal of Business and Management Invention* 5 (5): 71–77.
- Tarafdar, M., R. Singh, and P. Anekal. 2013. "Impact of ICT-Enabled Product and Process Innovations at the Bottom of the Pyramid: A Market Separations Perspective." *Journal of Information Technology* 28 (4): 279–295.
- Tarutè, A., and R. Gatautis. 2014. "ICT Impact on SMEs Performance." *Procedia - Social and Behavioral Sciences* 110: 1218–1225. doi:10.1016/j.sbspro.2013.12.968.

- Tranfield, D., D. Denyer, and P. Smart. 2003. "Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review." *British Journal of Management* 14 (3): 207–222. doi:10.1111/1467-8551.00375.
- Vainiomaki, J., and S. Laaksonen. 1999. "Technology, Job Creation and Job Destruction in Finnish Manufacturing." *Applied Economics Letters* 6 (2): 81–88. doi:10.1080/135048599353681.
- Williams, J. K. 2018. "A Comprehensive Review of Seven Steps to a Comprehensive Literature Review." *The Qualitative Report* 23 (2): 345–349.
- World Bank Group. 2017. *G20 Note: Technology and Jobs in the Developing World*. Washington, DC.
- Xiong, J., and S. Qureshi. 2015. "Information Technology for Development in Small and Medium-Sized Enterprises." In *Information Systems and Quantitative Analysis*, edited by J. Xiong and S. Quresh, 1–27. Omaha, NE: Dr. CC and Mable Criss Library.
- Yeboah, E. 2017. "The Impact of Microfinance on Grassroot Development : Evidence From Smes in Kwabre East District of Ashanti Region of Ghana." *Open Journal of Business and Management* 05: 577–591. doi:10.4236/ojbm.2017.54050.
- Yilmaz, K. G., and A. Ayci. 2016. "E-Commerce Adoption as a Predictor of the Perceived Strategic Value of E-Commerce among E-Commerce Adopter SMEs in." *International Journal of Management Studies and Research (IJMSR)* 4 (3): 35–43.
- Yunis, M., A. Tarhini, and A. Kassar. 2018. "The Role of ICT and Innovation in Enhancing Organizational Performance: The Catalysing Effect of Corporate Entrepreneurship." *Journal of Business Research* 88 (June 2017): 344–356.