

## Mapping and auditing digital literacy of civil servants in selected South African government departments

### ABSTRACT

As digital technology becomes ubiquitous, workers will increasingly need an appropriate set of digital skills to access and process information, using digital systems and tools. Hence, the aim of the study was to map and audit the digital literacy of civil servants in selected South African government departments in KwaZulu-Natal (KZN). Through a survey, four government departments, considered to be central to service delivery, were targeted. To obtain a representative sample, a systematic sampling method was applied. Data were analysed using the SPSS statistical analysis programme. The results suggested that not enough is being done to equip civil servants with the digital literacy skills they require to improve service delivery. As technology changes, so does the need for training in new technologies. Developing digital literacy in the workplace is a definite way for businesses and organisations to increase their work productivity and creativity. It is important to note that digital literacy is an essential requirement for effective and optimal participation in the world's economy. The digital era is not going to disappear, and the need for education to respond to the growing digital tide is rapidly increasing. A digitally literate workforce is crucial if government is serious about improving work productivity and creativity in the public sector.

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## **INTRODUCTION**

Digitally literate individuals are viewed as more flexible and adaptable, and capable of working more efficiently to improve work productivity and creativity (Nelson, Courier, & Joseph, 2011; Ng, 2012). Bawden (2001) argued that as digital technology becomes ubiquitous, workers will increasingly need an appropriate set of digital skills to access and process information, using digital systems and tools. It cannot be denied that Information and Communication Technologies (ICTs) are an integral part of many workplaces in the 21st century. For example, these tools are used for inter-office communication, industry research, generating documents and reports, and many other functions. Hence, digital literacy skills are not only useful, but essential in today's workplace. Digital literacy begins with becoming knowledgeable about how to turn a computer on and off, the functions that the buttons on the mouse perform, and the purpose of the function keys on the keyboard. These are all basic digital literacy skills needed in the workplace. This study on digital literacy is relevant in modern development, particularly in Africa where the utilisation of ICTs is either low or underdeveloped (Mbatha, Ocholla, & Le Roux, 2011; Mbatha & Ocholla, 2011). In terms of human needs, the use of ICTs has been buttressed by numerous researchers as catalysts in improving work productivity and creativity. However, this is only possible when the users of these tools possess the skills required to use them. ICTs are crucial in shaping organisational and social relations and in enhancing the ways in which social settings influence the use and design of ICTs. The problem investigated in this study is the poor usage of some ICT tools and services by civil servants in certain South African government departments.

The researcher has noted with concern that in Africa, and in the KwaZulu-Natal province (KZN), service delivery is often poor, because some ICT tools and services are either not utilised or not available at all (Mbatha & Ocholla, 2011). Past studies have shown that the use of ICTs by some civil servants is generally low both in frequency and variety (Mostert & Ntetha, 2008; Mbatha, Ocholla & Le Roux, 2011; Mbatha & Lesame, 2013). For example, Mostert and Ntetha (2008), in their study on the use of ICTs by civil servants in selected government departments in KZN, established that the use of ICTs by some civil servants was generally restricted to word processing and specific applications. In support of Mostert and Ntetha's study, Mbatha and Ocholla (2011) also established that ICTs such as databases and videoconferencing were used relatively seldom in some government departments in KZN. In Mbatha and Ocholla's study, civil servants identified a range of issues they regarded as inhibitors to their effective use of ICTs, including a lack of access to/availability of hardware/software and a lack of ICT education, skills and knowledge.

Undeniably, most jobs in the 21st century require a working knowledge of certain computer skills. For example, employers seek and reward employees with the skills and knowledge to send messages via e-mail; use spreadsheets to create graphs and paste them into a report; add and edit data in a database; understand the implications of file sizes, memory limitations, and network arrangements; and recognise the function and features of modern computer components. Any job candidate who already possesses these skills will stand out above those without these skills. The modern workplace is very competitive. Hence, a person needs to have a variety of skills that will give him/her the competitive edge that is required for success. By the same token, civil servants

need digital literacy in order to use modern technology to improve work productivity and creativity to the advantage of society (Mostert & Ntetha, 2008). Dobson and Willinsky (2009), postulated that digital literacy was driving the global information economy. ICTs have simplified jobs in the modern workplace. Consequently, a contemporary employee must be proficient in using a variety of ICT tools and services to enhance work productivity and creativity.

It was against this background that the researcher saw a need to conduct this study, because civil servants are mandated to efficiently deliver services to society. The rendering of such services has been facilitated by diffusing and adopting ICTs, and civil servants must be equipped with the relevant skills to deliver these services. Hence, the aim of the study was to map and audit the digital literacy of civil servants in selected South African government departments in KZN. The four government departments targeted were the Departments of Arts and Culture, Home Affairs, Education, and Health. To achieve this aim, the following research questions were posed:

- How do civil servants acquire digital literacy?
- What are the levels of digital literacy among civil servants?
- What challenges do civil servants encounter when using ICTs?
- How can civil servants' digital training needs be dealt with?

It is true that the importance of a study is judged by the contribution it makes towards furthering research and knowledge. This study could potentially benefit analysts who are in the process of researching and framing policies about ways in which government should train civil servants in the effective use of ICTs. Scholars who are not involved in policy analyses may also find this study particularly interesting, because it uses several contemporary examples of ICT policy debates to illustrate the value of socially and organisationally informed research. The outcome of this study is also aimed at benefiting the South African Civil Service, particularly in KZN. The assumption of the study is that civil servants in South Africa lack the digital skills that can help them use ICTs effectively to enhance work productivity and creativity due to the absence of an integrated ICT policy.

## **1. LITERATURE REVIEW**

ICTs are gradually becoming familiar tools in both the private and public sectors and have a great potential to initiate revolutionary changes in enhancing work productivity and creativity (Mbatha, 2013). In their study, Khalo and Hu (2010) noted that ICTs are radically redefining the world's social, economic and political landscape. They argued that since people live in the information age, their environment and needs are changed by the development of ICTs. In support of these views, Mbatha, Ocholla and Le Roux (2011) observed that the use of ICTs for gathering information and rendering services has been considered as a major objective of the modernisation agenda of government municipalities. In response to a view of government performance – particularly in the West – and the increasing public demand for the rendering of “better” services in terms of quality, accessibility and choice, it is worth mentioning that the mode of operation of government departments in South Africa has been subject to major modernisation efforts (Khalo & Hu, 2010). South Africa has one of the most sophisticated ICT infrastructures in Africa and was one of the

early adopters of the internet on the continent (Brown, Collins, Maleka, Morrison, Muganda & Speight, 2007). Brown et al., (2007) further observe that the importance of ICTs for national development was recognised at the very top by the then South African president, Thabo Mbeki, who announced the formation of the Presidential International Advisory Council on Information Society and Development in 2001.

The South African government regards the internet as a valuable tool for improving service delivery (Khalo & Hu, 2010). To this end, the country has made great strides in establishing and sustaining e-government (Khalo & Hu, 2010). However, the country is still facing challenges in the information age (Khalo & Hu, 2010). Hence, the government has embarked on a number of measures to ensure that ICTs play a significant role in society. In all the government departments surveyed in this study, ICTs have a significant role to play in improving work productivity and creativity. In their study, Trimi and Sheng (2008) concluded that since the 1990s, public-sector organisations across the globe have applied internet technology and other ICTs innovatively to deliver services, engage citizens and improve efficiency. Akpan-Obong and Parmentier (2009) concurred that ICTs are regarded as tools to foster socio-economic development. Technologies like computers, telephones and the internet are also critical for integration in countries, since they enhance the flow of communication, information and production. In the process, ICTs are considered to be direct agents of development, as well as facilitators of integration which, in turn, are likely to promote socio-economic development. In line with the above views, Zawada, Wallmach, Ngcobo and Mabule (2007) are of the opinion that many countries (developed and developing countries) are investing in ICTs to improve their business practices. The South African government has placed strong emphasis on ICT sector development through implementing a national ICT strategy, which proactively deals with ICT penetration, particularly in disadvantaged segments of the society (Zawada et al., 2007). Al-zhrani (2010) noted that South Africa was one of the very first countries to embrace convergence in its telecommunications policy trajectory. Mostert and Ntetha (2008) stated that ICTs are applied to access, analyse, evaluate, integrate, present and communicate information. Mbatha (2009) argued that when utilised in these ways, ICTs could transform the business environment and increase productivity and income. Nasi, Frosini and Cristofoli (2011) shared similar views by noting that ICTs have the potential to collect, store and manage large volumes of data and information, which could be transferred and shared among public managers and on a government website on a real-time basis.

A study on e-government conducted by Odat (2012), established that contemporary governments in many government states have embraced the concept of e-government to achieve a set of goals and objectives that would benefit all individuals, institutions and societies. Tobin, Porumbescu and Lee (2013) contended that improved external accountability and organisational learning are logical corollaries of the increasing use of ICTs by government departments to expand and diversify citizen interaction. The widespread adoption of ICTs results in structural changes in the internal organisation of the public service and its external interfaces with the public, and the suppliers of goods and services to government (Borins, 2007). In addition, Borins (2007) noted that, within the public service, ICTs would reshape the traditional departmental model in which each department has three capacities: policy development, service delivery, and internal support

services. Globally, ICTs have transformed the landscape in the public sector and progress is made on a daily basis to make more information available to the citizenry (Kling, 2000). ICTs have shrunk the traditional barriers of time and space while increasing the rate at which information can be transmitted, in bigger bulk, easier than ever before, making human endeavours in all spheres of life appear limitless (Mbatha & Ocholla, 2011). With respect to organisations, ICTs have become an important ingredient in organisational competitiveness, because ICT resources are increasingly linked to the overall organisational strategy, such as ICT-related decision-making in corporations (Mbatha, Ocholla & Le Roux, 2011). In the current information-driven economy, ICTs are regarded as power tools in the information/knowledge industry, because they are more the efficient economic substitutes for labour and older technologies (Mbatha, 2014). The effective use of ICTs can contribute towards improving the quality of life, encouraging peace, strengthening unity, establishing good governance, raising the level of education, and building a strong and competitive economy (Kling, 2000). ICTs have the potential to transform service delivery and catalyse the development of the information society. However, it is important to note that all of the above can only be achieved if the users of such technologies have the relevant skills to make use of them.

Rogers' *Diffusion of Innovations* theory was found to be useful, as this study sought to map and audit the digital literacy of civil servants in four selected South African government departments in KwaZulu-Natal. This theory has also been widely applied to investigate the diffusion of organisational and societal innovations and is one of the theories that explain the acceptance of technology. In his comprehensive book, *Diffusion of Innovation*, Rogers (1995) defined diffusion as "the process by which an innovation is communicated through certain channels over time among the members of a social system." This theory purports to describe the patterns of adoption, explains the mechanisms, and assists in predicting whether and how a new innovation will be successful. Rogers (1995) argued that those innovations which are perceived by individuals as having greater relative advantage, compatibility, trial-ability and observability will be adopted more rapidly than those which are perceived to be more complex. However, it is important to note that a technology can have a greater relative advantage, but if its adopters are digitally illiterate, it is pointless to adopt technology. Hence the workforce should be equipped with digital skills in order to improve work productivity and creativity.

## **2. RESEARCH METHODOLOGY**

A survey targeting key government departments was used to collect data. Because the public sector in South Africa is diverse and dispersed, the scope of the study was limited to government departments in KZN. In order to obtain a representative sample, the systematic sampling method was applied. Using this technique, five out of 11 suitable district municipalities were selected, utilising every second district from a list. The sample size for the whole study was 260 managers. A total of 152 (58.4% response rate) questionnaires were completed and returned. The five district municipalities selected were uMgungundlovu, uMzinyathi, Zululand, uThungulu and Sisonke. In these districts four government departments were targeted, namely Arts and Culture, Home Affairs, Education and Health. These departments were sampled using purposive and systematic

sampling techniques. Three selection strategies were used: i) identifying highly dispersed and service-intensive departments; ii) categorising personnel in the selected departments into top-, medium- and lower-level management; and iii) dividing the service areas into rural or urban-based centres. The data collected were analysed using thematic categorisation and tabulation, and the findings were presented descriptively.

In terms of ethical considerations, informed consent was obtained from each participant in the study to ensure that they understood what they were doing and to verify their willingness to participate. The respondents were informed of their rights, including the right of consent, protection from disclosure of information, and respect for their privacy. All the research participants participated voluntarily. The researcher ensured that the participants were not exposed to risk and embarrassment, unusual stress or any demeaning treatment. Anonymity and confidentiality were promised and maintained. The information the participants provided was not made available to those who were not directly involved in the study. The researcher also ensured that the participants remained anonymous throughout the study. In terms of professional standards, the researcher ensured that the results were gathered in a professional manner, without misrepresenting anyone and/or intentionally misleading the respondents about the nature of the study. The researcher ensured that all the findings were presented honestly, without fabricating any data to support any particular finding. The researcher adhered to institutional guidelines.

### **3. RESULTS**

The results are reported under the following headings: Demographic profile of respondents; Civil servants' methods for acquiring digital literacy; Civil servants' levels of digital literacy; Challenges faced by civil servants when using ICTs and Solutions to civil servants' digital training needs.

#### ***3.1 Demographic profile of respondents***

In terms of job titles, the respondents ranged from assistant managers to district managers, with the majority (33; 22%) holding the position of assistant manager. Most of the respondents (66; 43%) had bachelor degrees. A study by Majanja and Kiplang'at (2003) established that most professionals above the age of 40 years in developing countries are often conservative and slow in keeping pace with ICT developments. In line with the views above, this study established that a large number of respondents were between the ages of 40 and 49 (47%) and lacked digital skills. This age group was followed by respondents who were between 30 – 39 years of age (28%). Respondents in the age group of over 50 years and those between 20 and 29 ranked third and fourth respectively. It was also vital to assess gender proportionality in the study, since it is a widely held view that males dominate access to ICTs and the use thereof. Earlier studies have identified women and girls as disadvantaged in their uptake of ICTs (Botha, Small & Crutchley, 2001; Hafkin & Odame, 2002) found that disparities in the use of ICTs are much greater in Africa, with the involvement of women being as low as 5%. Majanja and Kiplang'at (2003) also suggested that gender disparity among professionals in Africa could be attributed partly to the educational system and partly

to factors inherent in society at large. This issue was reviewed by Mbatha, Ocholla, and Le Roux (2011), who argued that it had been empirically proven that there are differences in the attitude, confidence and anxiety levels of women and men in the public sector with regard to using computer technology. The results of the study indicated that there was clear male dominance (89; 59%) in the sample population. In terms of the level of management, most of the respondents (68; 45%) were top managers.

### **3.2 Civil servants' methods of acquiring digital literacy**

It was significant to uncover how the civil servants acquired their digital literacy. The respondents were asked questions pertaining to computer skills. Appropriate multiple answers were selected, using a close-ended questionnaire. The respondents were allowed to choose more than one option and asked to provide other options that were not listed. Table 1 below presents the results.

**Table 1: Civil servants' methods of acquiring digital literacy (N=152)**

Variables	Strongly agree		Agree		Disagree		Strongly disagree		Mean	Level
	N	%	N	%	N	%	N	%		
Self-taught	68	45	18	12	25	16	41	27	2.2	1
Colleagues	36	24	23	15	21	14	72	47	2.8	4
In-house course offered by the department	39	25.6	32	21	7	4.6	74	48.6	2.7	4
On-the-job experience/training	69	45.3	25	16.4	31	20.3	27	17.7	2.1	1
Continuing education course	41	27	31	20	9	6	71	47	2.7	4

When asked to comment on how they acquired their digital literacy, a larger number of the respondents (45%) strongly agreed that they acquired digital skills through self-study, 12% agreed, while 16% disagreed, and 27% strongly disagreed with the statement. The results further show that 24% strongly agreed that they were taught by their colleagues, 15% agreed, 14% disagreed, and 47% strongly disagreed. With regard to acquiring digital skills through an in-house course offered by their employers, a significant number of the respondents (49%) strongly disagreed, followed by those who strongly agreed (26%), while 21% agreed, and the minority (5%) disagreed. With reference to the assertion on acquiring digital literacy through on-job experience, a larger number of respondents (45%) strongly agreed, while 16% agreed, 20% disagreed, and 18% strongly disagreed with the assertion. With regard to continuing educational course, a large number of respondents (47%) strongly disagreed, followed by those who strongly agreed (27%), whereas 20% agreed, and 6% disagreed.

**3.3 Civil servants' levels of digital literacy**

The study sought to gauge the respondents' competencies in using ICT tools and services. The respondents were required to rate their digital literacy skills on a Likert scale of 1 (excellent) to 5 (very poor). Table 2 summarises the responses and data were cross tabulated and presented according to frequency.

**Table 2: Civil servants' level of digital literacy (N=152)**

ICTs	Excellent		Good		Satisfactory		Poor		Very poor		Mean	Level
	N	%	N	%	N	%	N	%	N	%		
TV	152	100	-	-	-	-	-	-	-	-	1	1
Radio	152	100	-	-	-	-	-	-	-	-	1	1
Video camera	88	58	56	37	8	5	-	-	-	-	1.4	1
Video recorders	93	61	59	39	-	-	-	-	-	-	1.3	1
Tape recorder	152	100	-	-	-	-	-	-	-	-	1	1
Data projectors	26	17	31	20	56	37	39	26	-	-	2.7	3
Laptop	152	100	-	-	-	-	-	-	-	-	1	1
Fax machine	152	100	-	-	-	-	-	-	-	-	1	1
Video conference	9	6	25	16	14	9	41	27	63	41	3.8	5
PC	152	100	-	-	-	-	-	-	-	-	1	1
Internet	42	28	31	20	52	34	27	18	-	-	2.4	3
Intranet	23	15	54	36	57	38	18	12	-	-	2.4	3
Mobile phones	152	100									1	1
Databases	19	13	37	24	53	35	43	28	-	-	2.7	3
Telephone	152	100	-	-	-	-	-	-	-	-	1	1
Copying machine	152	100	-	-	-	-	-	-	-	-	1	1
Printer	152	100	-	-	-	-	-	-	-	-	1	1
Scanner	94	62	27	18	31	20	-	-	-	-	1.5	1
E-mails	152	100	-	-	-	-	-	-	-	-	1	1

When asked to rate their ICT skills, all the respondents (100%) suggested that their skills were excellent when using ICTs such as the television, radio, laptops, personal computers, fax machines, mobile phones, printers, telephones, tape recorders, e-mail, and copying machines. Most of the respondents (58%) indicated that their video camera skills were



excellent. Levels 1 and 2 on the Likert scale suggested that all the respondents (100%) had good skills with respect to video recorders. The larger group (37%) revealed that their data projector skills were satisfactory. With respect to databases, a significant number of the respondents (35%) revealed that their skills were satisfactory. As far as videoconferencing is concerned, 68% of the respondents marked off 4 and 5 on the Likert scale, revealing that their videoconferencing skills were very poor. By combining 1 and 2 on the Likert scale, which translates to 73 (48%), it would be fair to assert that a significant number of respondents possessed good internet competencies. An average number of respondents (51%) (2 and 1 on the Likert scale) indicated that their intranet competences were good. One hundred and twenty-one respondents (80%) marked off 2 and 1 for scanners on the Likert scale, suggesting that most of them could use scanners.

### **3.4 Challenges faced by civil servants when using ICTs**

The respondents were asked questions pertaining to the impediments to ICT usage in their respective departments. Using an open-ended questionnaire, appropriate multiple answers were requested. Table 3 presents the results.

**Table 3: Challenges faced by civil servants when using ICTs (N=152)**

Variables	Strongly agree		Agree		Disagree		Strongly disagree		Mean	Level
	N	%	N	%	N	%	N	%		
Cannot use file management	65	43	12	8	40	26	35	23	2.2	1
Cannot use windows and keyboard					5	3	147	97	3.9	4
Cannot use MS Word					16	11	136	89	3.8	4
Cannot use MS Excel			16	11	37	24	99	65	3.5	4
Cannot use database (s)	91	59.8	34	22.3	6	3.9	21	13.8	1.7	1
Cannot use PowerPoint	12	8	35	23	31	20	74	49	3.0	4
Cannot send e-mails							152	100	1	4
Cannot use the internet					13	9	139	91	3.9	4
Cannot create a file							152	100	1	4
Cannot create a folder							152	100	1	4
Cannot troubleshoot	78	51	16	11	37	24	21	14	2.0	1

Table 3 shows that a significant number of the respondents (43%) strongly agreed that they cannot use the file management system, while only 8% agreed, 26% disagreed, and 23% strongly disagreed. With regard to a lack of Windows and keyboard skills, the majority of respondents (97%) strongly disagreed with the statement. As far as MS Word is concerned; the majority of respondents (89%) strongly disagreed with the statement. With reference to the statement that they cannot use MS Excel, the majority of respondents (65%) also strongly agreed, while only 11% agreed. A percentage of 63% participants strongly agreed that they cannot use databases, while only 14% strongly disagreed. With reference to the use of MS PowerPoint, 49% respondents strongly disagreed that they cannot use the program, while only 8% strongly agreed. The table further shows that all the respondents (100%) strongly disagreed that they cannot use emails, files, and folders. The majority (91%) further strongly disagreed that they cannot use the internet, while 9% disagreed. As far as the assertion that respondents cannot perform troubleshooting on a computer is concerned, the majority (51%) strongly agreed, while 11% agreed, 24% disagreed, and 14% strongly disagreed with the statement.

### 3.5 Civil servants’ digital literacy training needs

As reflected in the table below, the respondents were required to answer a question based on the type of training required to help them use ICTs more often and effectively. In this question, a scale of 1 denoted a favourable response – very essential, followed by 2 (i.e. essential), 3 (i.e. quite essential), and 4 (not very essential). The respondents were, therefore, provided with a list of possible training needs and asked to rate each one of them on the Likert scale. The respondents were at liberty to provide any other training needs that were not listed in the questionnaire.

**Table 4: Civil servants’ digital literacy training needs (N=152)**

Training needs	Very essential		Essential		Quite essential		Not very essential		Mean	Level
	N	%	N	%	N	%	N	%		
Word processing	-	-	-	-	22	14	130	86	3.8	4
Surfing the internet	30	20	23	15	12	8	87	57	3.0	4
Spreadsheet	118	78	29	19	5	3	-	-	1.2	1
File management	103	68	41	27	8	5	-	-	1.3	1
PowerPoint	107	70	33	22	12	8	-	-	1.3	1
Database searching	134	88	18	12	-	-	-	-	1.1	1
Information retrieval	148	97	4	3	-	-	-	-	1.0	1
e-mails	-	-	-	-	-	-	152	100	1	4
e-government	152	100	-	-	-	-	-	-	1	1
e-commerce	98	64	54	36	-	-	-	-	1.3	1

e-banking	43	28	52	34	16	11	41	27	2.3	2
Cellphone banking	12	8	28	18	44	29	68	45	3.1	4
e-learning	45	30	2	1	24	16	81	53	2.9	4
Information security	101	66	41	27	10	7	-	-	1.4	1

The survey results in the table above indicated the following: training in word processing was not very essential (86%); training in internet surfing was also not very essential (57%); training in spreadsheets was very essential (97%), as well as training in file management (97%); training in PowerPoint presentation was also very essential (92%). All the respondents (100%) indicated that training in database searching and information retrieval was very essential, and they all indicated that training in e-mail was not very essential (100%). Only 34% of the respondents felt that training in e-government was very essential and 20% indicated that training in electronic commerce was essential. A small percentage (28%) felt that training in electronic banking was very essential and a very small percentage (8%) indicated that training in cellphone banking was very essential. The results further indicated that 30% of respondents felt that training in electronic learning was very essential, and the majority said it was not very essential (53%). Training in information security was very essential (66%), 27% said it was essential and none of them said it was not very essential.

#### **4. DISCUSSION**

It was significant to uncover how the civil servants acquired their digital literacy. Sometimes organisations have unfair expectations that all their staff can use ICTs effectively. In many organisations, employees are provided with their own organisational ICTs to use for work purposes, but the question is, who equips them with the skills they need to use these ICTs? Table 1 shows that most of the civil servants acquired their skills through self-study/self-training. These results suggest that government is unfair in its expectation that all its civil servants possess the necessary digital skills to use ICTs. These results may also suggest that there is no ICT policy in government departments, because if there were, there would have been proper planning, an ICT policy on training and the use of ICTs in the public sector. Evidently not enough is being done to equip civil servants with the ICT skills they require to improve service delivery. In his study on the use of ICTs in government departments, Nwasike (2007) suggested that training should be made compulsory for civil servants, especially when there is a choice and access to training.

As technology changes, so does the need for training with respect to emerging technologies. This issue was revisited by Mbatha, Ocholla and Le Roux (2011), who argued that it was vital for every government employee to familiarise himself or herself with the latest ICT technology in order to reap the benefits of technology, improving productivity and creativity which are intrinsic to a government's success. Overall, the results demonstrated that civil servants require training in using ICT tools and services in the sector. However, it remains unclear as to what extent the civil servants could use an ICT tool such as the internet, because when they were asked to indicate their ICT training needs in table 4, almost all of them said that they required training in

quite a number of internet services such as e-government, e-commerce, information retrieval and searching databases. One of the objectives of the study was to gauge the respondents' competencies in using ICTs. The results showed that all the respondents had excellent skills to use ICTs such as the television, radio, laptops, personal computers, fax machines, mobile phones, printers, telephones, tape recorders, e-mail, internet, scanners and photocopying machines. However, civil servants lacked the skills to use ICTs like databases and videoconferencing. They had impediments to ICT usage, such as the inability to use the file management system, MS excel, databases, and general troubleshooting on a computer.

In order to be able to use any technology effectively, a person must be well-equipped with the essential skills. As illustrated in table 4, civil servants indicated different areas of training required to help them interact with ICTs more often and more effectively. The results indicated that training in some computer applications, such as word processing, e-mails, information processing were not necessary; this can be attributed to the fact that most of the civil servants use these skills on a daily basis. Because all the respondents were managers, one would be tempted to say they had to lead by example and had to be the first to adopt 'newer' ICTs in the sector. The greatest training needs appeared to be database searching and information retrieval. Database searching and information retrieval are essential to business success. One would expect to see all the civil servants properly trained with respect to computer applications like those. Civil servants also need computer training to ensure that they keep up with the information society. This view is shared by Mbatha, Ocholla and Le Roux (2011), who argued that training sessions for civil servants should be conducted, enabling them to use the acquired ICT knowledge and skills in their daily work and activities. This issue was raised earlier by Petty (2007), supported by Mbatha and Lesame (2013), who observed that, due to government's continuous striving towards the e-government culture, civil servants have to be involved in the ICDL (International Computer Driving Licence) programmes that will help them acquire the computer skills required to assist the public. If civil servants lack the necessary skills to use ICTs, these tools would not be effective as far as work creativity and productivity are concerned.

If the South African government wishes to diffuse and adopt the use of ICTs, a number of important issues need to be dealt with first. These include the need for adequate and well-structured planning, and the need to make funds available to equip civil servants with the relevant skills required for using ICTs to improve work productivity and creativity. The issue of planning is crucial, since embarking on any new innovation requires adequate planning. As Tella (2007) correctly argued, "adequate and proper planning usually results in success". It is evident that the poor computer skills of civil servants are hampering their interaction with ICTs, which results in poor work productivity and creativity. It is important to note that, without the right human capacity, there would not be anyone to operate ICTs, or do minor repairs. Civil servants, specifically those in managerial positions, are required to have a fairly broad and extensive knowledge of ICTs. As leaders, they should be effective users of these technologies.

Many studies have examined barriers to adopting and diffusing e-government in many countries. Ebrahim and Irani (2005) provided a review of the barriers to e-government adoption using five

dimensions, namely IT infrastructure, security and privacy, IT skills, and organisational as well as operational costs. Likewise, Lam (2005) also identified these barriers, and a lack of computer skills were among the barriers on his list. Mbatha and Ocholla (2011) expressed the opinion that South Africa has a relatively well-developed ICT infrastructure that provides both government and the public with potential access to many ICT tools and services. Mbatha, Ocholla and Le Roux (2011) argued that, besides having ICTs that are irrelevant in job execution, the major problems in SA government departments seemed to be the following: Lack of ICT skills among civil servants; civil servants' attitude towards ICTs; the lack of technical expertise and focus on objectives regarding the use of ICTs in the sector; resistance of staff to the use of ICTs; and the lack of information about ICTs and their perceived benefits.

## **5. CONCLUSION AND RECOMMENDATIONS**

The aim of the study was to map and audit the digital literacy of civil servants in selected South African government departments in KwaZulu-Natal. ICTs are capable of making government processes more transparent and accountable. However, South Africa has to first improve computer skills before it can have fully functional e-government programmes. ICTs can only improve the civil servant work environment if civil servants possess the necessary skills to use them. The education system should come up with strategies to equip students with the skills they need in the e-government environment. The diffusion and adoption of ICTs in government departments require expertise at various levels. The absence of technical know-how is a cause for concern, because existing ICTs may fail if the staff lack the skills to operate them or do minor repairs. Consequently, frequent training in the use of ICTs is essential, because new software is constantly being developed and introduced into the market; and staff members need to be acquainted with these trends and developments. If the government wishes to reap the benefits of adopting technologies in the public sector, the urgent need to attend to the ICT training needs of its civil servants should be borne in mind.

Based on the results of the study, a range of general recommendations for improving the use of ICTs in government departments are provided below. These recommendations aim to stimulate thought and discussion about the path that the use of ICTs might take in the future of government departments. The public workforce remains the main driving force behind the 'supply side' of e-government applications. They are also essential to planning, designing and implementing any e-government initiative. Therefore, civil servants have to be equipped with the right aptitude (skill), perception (understanding) and attitude (desire), and should be able to move with the times. e-Government offers a new platform of social contract that binds three parties: the public at large, government, and business (UN, 2003). To translate this new social contract into public value, one of the most important requirements is the readiness of the public managers who function as the 'steering force' behind e-government applications. The transformation from traditional government to e-government is also only possible if the public management system and citizens in general are able to control, transmit and properly use the information resources at their disposal. The e-participation of various actors is, therefore, becoming an important requirement for good governance.

Transformation from traditional governance to e-governance is not a linear process. Success in the area of e-governance requires more than just the deployment of technology and building connectivity. It requires much broader and far-reaching readiness in terms of policy initiatives, infrastructure building and skills development, most of which are not technical by nature (UN, 2003). Structural and human capital-related changes are needed at government level to introduce effective e-government practices. There is a need to increase the supply side's e-readiness through training and development supported by operational plans to execute policies. e-Government is a powerful device devoid of political meaning; it is an information resource to the community. But public managers, such as the suppliers of cost-effective and quality services, should be at the right level of e-readiness.

e-Government systems require adequate access to modern technology and the ability to reconstitute the governance mechanism. Adequate human resource capability is necessary to coordinate internal and external service factors to deal with the demand for services (Wimmer, 2002). A sustainable ICT programme that contributes significantly to a country's development could be realised if the workforce is suitably trained and the educational system is able to continually supply skilled, innovative and entrepreneurial professionals. The government should ensure that adequate varieties and levels of ICT competence training are offered to civil servants. Where necessary, it should constantly review the ICT training it offers to civil servants, especially considering the rate of developments in the ICT industry. Civil servants need computer training to ensure that they keep up with the rest of the world in the new information society. A strategy that would assist tremendously would be to ensure that everyone in the department, particularly IT personnel, has general skills for simple trouble-shooting and recovery. This can be achieved through regular seminars and workshops. Centres of excellence should also be established within government ministries to train and develop expertise as required.

Across a range of educational applications, ICTs should be harnessed to improve the efficiency, accessibility and quality of the learning process in South Africa. This can be achieved by using initiatives such as distance education. Distance learning has mainly been applied to tertiary education, but ICTs have been found to have a significant impact on enhancing the learning process at primary and secondary level education. Another rapidly growing area of ICT-mediated learning could be in the technical and vocational training of civil servants. Because ICTs can facilitate sophisticated and customised performance simulation at low marginal cost, the government should use ICTs to train workers in an array of functional areas, from healthcare to IT services. For example, Cisco's Networking Academy Program provides a 280-hour technical training course on the internet. This course can train civil servants on how to design, build, and maintain computer networks. Enhancing education through ICTs, both as a classroom tool and as a subject in its own right, needs to be considered as one of the priorities of the government. Developing digital literacy in the workplace is a good move for businesses and organisations to increase their productivity. It is important to note that digital literacy is the essential requirement for effective and optimal participation in the world's economy. The digital era is not going to disappear, and the need for education to respond to the growing digital tide is rapidly increasing. A digitally literate workforce is crucial if government is serious about improving work productivity and creativity in the public sector.

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