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Digital Re-imagination Colloquium 2018

Preparing South Africa for a Digital Future through e-Skills

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13 March 2018

Emnotweni Sun, Mbombela, Mpumalanga

National Electronic Media Institute of South Africa (NEMISA)

ICT4D Flagship, University of South Africa

Digital Re-imagination Colloquium 2018:

Preparing South Africa for a Digital Future through e-Skills

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and

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Preface

The theme of the 2018 colloquium, "*Digital Re-imagination: Preparing South Africa for a Digital Future through e-Skills*" sought to establish an innovative research network through providing a platform for government, academia, industry, education and civil society to share research, data and trends that will contribute to refining the mandate to develop the necessary e-skills capacity of South Africa

With the dawn of every new age, the nature of work and our relationships change. The impact of these changes to the digital economy affect entire systems of production, management, and governance. For example, government is currently designed as linear and mechanistic yet the digital economy is made up of adaptive systems. William Gibson has famously been quoted for the phrase: "*The future is already here — it's just not very evenly distributed.*"

Given the extant amount of data available today, it is now possible to predict (within some margins of error) how people will behave in certain situations. Data is increasingly becoming better structured and easy to access. The question is, are we ready for the future? Are we ready to harness the opportunities that the digital economy has brought? Can the digital economy make a better South Africa for all?

Technology today is able to perform exponentially better than we can; how then can we create new industries and new forms of governance? It is critical to re-think how systems are being implemented. Creativity and innovation is big business in the digital economy. Creativity and innovation moves contributions to beyond the individual and the group - to societal, disciplinary, national and global level.

The prevalent economic paradigm of a winner who takes it all means that the lower income earners are increasingly more dissatisfied. One of the symptoms of any illness is pain. Pain can be seen in our society in the form of unemployment, poverty and the dissatisfaction with the status quo. The challenges in our society cry out for change - a new way of thinking about employment, wealth creation and governance. What are the real opportunities that the digital economy presents to the people of South Africa? Real opportunities are those which are not only available substantively, but are also achievable by the people for who they are created.

The opportunities presented by the digital economy can only become real if we e-skill people to take advantage of those opportunities. Countries in the East have been able to adapt technologies without giving up the cultural values they hold dear. While the challenges we face in South Africa may be seen as a problem, they also present an opportunity to make a difference with Digital Skills. It is no longer enough to have a skill; technology, talent and insight are becoming critical as well.

The colloquium received 13 submissions. These submissions include four full papers, one concept note and eight abstracts. The submissions were all blind peer reviewed by at least two reviewers. None of the authors nor editors were involved in reviewing their own submissions.

Hossana Twinomurinzi

Tendani Mawela

Kanye Rampa

Mymoena Ismail

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KEYNOTE ADDRESSES

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Prof Wallace Chigona – University of Cape Town

Prof. Chigona commenced his address, which was titled “Beyond Access”, by providing an overview on access to Information and Communication Technologies (ICT), the internet and mobile technologies from an African perspective. Some interesting statistics on the proliferation of mobile phones was shared with the audience. For example, a global surge in cell phone ownership in the past 15 years was noted to the extent that by the year 2014 approximately 75% of people owned a cell phone (feature phone or lower). This trend was continuing well beyond 2014. It is widely accepted that mobile technologies have significantly transformed communication especially in sub-Saharan Africa. Whereas most cell phone users utilise mobile technologies for messaging and taking photos, increased use in areas such as mobile banking was recorded as smart phones become more affordable and mobile coverage increases especially in rural areas. Prof. Chigona’s address also reflected on two case studies involving: (i) the implementation of a mobile health application in Malawi; and (ii) the use of mobile phones by Small, Micro and Medium Enterprises (SMME’s) in the Western Cape Province of South Africa.

The Malawi case study sought to establish: “How does the use of m-Health contribute to the achievement of maternal health outcomes?” This case relates to the implementation of the Mobile System for Safe Motherhood (MSSM), which is aimed at maximizing healthcare access and utilization by mothers who as a result of residing in remote locations experience long delays and high expenditure when accessing healthcare. The numerous benefits associated with MSSM such as convenient, affordable and timely services, privacy and confidentiality as well as information and service quality were noted. To this end, the MSSM resulted in positive health outcomes, which included a decrease in maternal and neonatal deaths. There were various conversion factors that needed to be taken into consideration that impacted the implementation and success of the project. These factors included personal characteristics of each mother (e.g. literacy levels, education and age) and socio-political factors such as the involvement of community leaders for purposes of community buy-in. Other social and cultural factors such as perceived privacy and traditional beliefs also proved to be important. Additional environmental and contextual factors such as the impact of the existing health system as well as challenges relating to telecommunication infrastructure and information system were also highlighted.

The SMME case study reflected on the critical role played by SMME’s in the creation of jobs and growth of economies of developing nations such as South Africa. The role of technology and digital inclusion as a way of supporting entrepreneurial activity was also discussed. The research was conducted using interviews and focus groups with a variety of small businesses in the Overberg District, Western Cape Province of South Africa. Key lessons learnt included the fact that cell phones were the most used technology by SMME’s. Business owners highlighted a need for information on and access to government funding. Most of the entrepreneurs also indicated lack of knowledge regarding currently available initiatives to support small businesses. Young SMME owners are very proactive in teaching themselves new technologies that are relevant to their businesses. The case study also highlighted the following challenges: those that relate to the needs of specific members of society (e.g. based on gender, disability and age); uneven network distribution; low literacy levels; and a lack of requisite skills required by entrepreneurs to use ICT to achieve their specific business goals. In closing, a few recommendations such as considering the use of “infomediaries”, open access technologies as well as training, mentoring and support initiatives for SMME’s were proposed.

Prof. Nixon Muganda Ochara – University of Venda

Prof. Ochara's address was titled "A Relational View of an Open Knowledge-Driven Society". The address firstly reflected on the journey of ICT for Development (ICT4D) research over the past few decades. Thereafter, the address highlighted a clarion call to ICT4D researchers and practitioners to avoid getting lost in the statistics that may give an impression that access to ICT (Information and Communication Technologies) have increased. In reality, many communities, particularly in rural areas, are still left behind and do not have access to ICT and the internet.

The notion of "Open Development" was then introduced as a new paradigm that may be considered by the ICT4D domain. Open Development places an emphasis on "who" participates in development initiatives and thus elevates a participatory approach and the involvement of those being targeted within ICT for Development projects, namely the beneficiaries.

Some insights into how Open Development may be conceptualised were also offered. Key themes emanating from this conceptualisation include:

- Development is viewed as **freedom** with several indicators such as Human Development Index, the Inequality-adjusted Human Development Index, the Gender Inequality Index, and the Multidimensional Poverty Index used for measuring the development levels.
- The role of **human beings** as intentional, creative and emancipatory actors is important.
- Accessible **knowledge** that is openly available and shared supports Open Development.
- The **society** and various **systems** therein (such as the economic system) should stimulate conscious human evolution and freedom.
- The **values** that underpin Open Development are those of caring for others, collaborating and sharing.

In addition, the pertinent issue regarding Big Data and how it relates to Open Development was discussed. The notion of the threat of the Big Data Divide as a continuation of the Digital Divide was discussed and linked to policy analytics.

In his closing remarks, Prof. Ochara reviewed a "Host-Guest" view of resistance to technology. It was argued that technology is often viewed as a *host* when introduced to a community or organisation, and this may fuel resistance towards accepting and using it. Interventions linked to technology should instead consider that recipients may view technology as a *guest* in their community. To this end, when viewed as a guest, the technology will have to fit into local customs and norms in order to support the needs of the community in which the technology is deployed. Such an approach will enhance the longevity and social sustainability of such technology-driven initiatives.

PAPERS

OPEN GOVERNMENT DATA INTERMEDIARIES FOR SERVICE DELIVERY: E-SKILLS POLICY IMPLICATION

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ABSTRACT

The idea of using open government data (OGD), among others, for effective service delivery, is increasingly gaining prominence, particularly in developing countries. Since OGD is delivered and accessed through the use of the contemporary information and communication technologies (ICT), notably the internet, means that the providers of OGD (e.g. governments and agencies) and beneficiaries (e.g. citizens) must possess specific e-skills in order to provide and use OGD effectively. However, the intended beneficiaries of OGD, the neediest citizens, are not yet able to use these data independently as many of them do not possess the requisite e- skills. They will, therefore, not be able to use OGD to influence much-needed service delivery in any meaningful manner. In this study, it is argued that the e-skills chasm can be temporarily bridged by introducing OGD intermediaries, who should also possess and be able to transfer specific e-skills. As this topic has not yet been addressed by the South African e-skills agenda, in this paper discussions relating to the place and role of intermediaries in the future e-skills policymaking are discussed.

Keywords: Open Government Data, intermediaries, e-Skills, policy implications, service delivery.

Introduction

The provision of public services remains a key occupation for governments as services underpin human welfare and drive economic growth. Not only do services such as education, healthcare or community safety provide requirement of citizens, they also represent an interface for shaping the self-same citizen's sense of trust in and expectations of government (OGP, 2017). Citizen-centric public services need to be timeously delivered with integrity while being responsive to the needs of the citizens, particularly those of the most vulnerable communities. The enabling ordinary citizens to assess the quality, adequacy and effectiveness of basic services, to voice their needs and preferences and to allow them opportunities to offer improvements and innovation, provides an opportunity for better use of public funds while improving service delivery. The creation of such an enabling environment also provides greater transparency (Ringold et al., 2013)

In this era dominated by modern information and communication technologies, citizens are connected like never before and have the passion to solve problems. Local people often possess the context-sensitive know-how, which provides solutions to problems in their area.

Local people are however rarely empowered due to bureaucratic and even hierarchical processes that needs to be followed thus leading to them experiencing inadequate public services that are impersonal, irrelevant and inefficient (OGP, 2017).

Technology and open data engender a different kind of participation. Open government data (OGD) is a subset of open data, and it represents the use and re-use of government data (Ubaldi, 2013) in order to empower government agents to promote a better life for citizens (Goldsmith & Crawford, 2014). OGD allows anyone to write a citizen-facing application using government data, creating new interfaces to the government, and opening up new possibilities (Lathrop & Ruma, 2010). For example, Tanzania implemented a Water Point Mapping System to make rural water supply services more efficient and accountable. This example has high relevance to many South African regions that have, in recent years, been badly affected by drought and water shortage.

However, translating data into information and, consequently, an appropriate action is still challenging for many people in developing countries (Ringold et al., 2013). It is argued that “*data alone is not knowledge*” (Ohlhausen, 2014), hence certain requisite skills are required to transfer or even transform data into usable information and knowledge (Gomez & Heeks, 2016).

On the other hand, it is widely reported that the shortage of e-skills in developing countries, such as South Africa, inhibits and regrettably excludes citizen's participation in the information society and knowledge economies (Binsfeld, Whalley & Pugalis, 2016; Mitrovic, Sharif & Taylor, 2014). Recent studies specifically confirmed a lack of skills relevant to effective provision and use of open data (Open Data Barometer, 2015; Davies, 2014; OECD, 2014).

Addressing these issues by exploring OGD consideration and mapping them to e-skills, Mitrovic (2015) suggests that the vast majority of South African citizens in need of service delivery will not be able to acquire these skills in the near term without systemic policy-making interventions. Therefore, there is a current need to involve and introduce a third party in the form of OGD intermediaries, who can help the intended beneficiaries to use of OGD in order to positively influence service delivery.

However, these intermediaries should necessarily possess certain e-skills in order to perform their work effectively. Furthermore, the intermediaries may be used as a catalyst for (up)skilling the wider community and public. For a successful intervention to be achieved, it is critical that the placement of OGD intermediaries and their role in the policy-making be clarified. To this end, this paper seeks to contribute to the discussion on the place and role of intermediaries in the use of OGD for effective service delivery and possible policy-making implication.

Olugbara et al. (2014) have concurred that “The ineffectiveness in public service delivery to communities is often ascribed to a number of factors, including e-skills deficiencies. In particular, Kwazulu-Natal Community Development Workers (CDWs) in South Africa wanted to use ICT to improve the effectiveness of public service delivery to their communities.” However the CDWs often lack adequate e-skills to effectively make such a contribution. This lack of e-skills coupled with the subsequent ineffectiveness in service delivery has necessitated a search for innovative service interventions. A case study based on such interventions has identified, amongst others, the following factors that can inhibit the successful applications of ICT by CDWs:

- The educational background of CDWs might limit them to rapidly grasp some of the important strategies that could help them build sufficient ICT skills.

- The training duration might be too short for CDWs to master the rudimentary concepts that could help them to adequately apply ICT in the workplace.

This, therefore, suggests that the training of the intermediaries must be handled with careful thought and proper planning.

Approach to this study

This study was a part of a larger international project dedicated to building open data capacity through e-skills acquisition. Similar to the other phases of the project, this study deployed a qualitative, exploratory Case Study Methodology (Yin, 2009; Baxter & Jack, 2008). The decision for selecting this approach was supported by the fact that: (i) the role of intermediaries in OGD is a recent phenomenon that is still in an early stage of development (Janssen, Charalabidis & Zuiderwijk, 2012); and (ii) e-skilling in the developing countries, such as South Africa, is very much contextually dependent (Mitrovic et al., 2012).

The sample consisted of 11 government officials (ICT professionals, middle-level managers and the departmental executives) and 40 citizens ranging from small business owners and students to social workers, engineers, ICT professionals and legal advisors.

The ‘case’ or ‘unit of analysis’ (Miles & Huberman, 1994) in this study was the answer of the interviewee, which is perceived to contain information relevant to the role of OGD intermediaries. The data were analysed using the Grounded Theory Methodology (GTM) method of identification and constant comparison of the emerging patterns as well as the ‘memoing’ technique for recording and comparative analysis of the findings.

E-skills classification used in this study

Although e-skills are essential survival skills for the 21st century (Chinien & Boutin, 2011), there is still no commonly accepted definition of this concept. Hence, this study adopted South African National e-Skills Plan of Action (NeSPA, 2010) definition, which looks at e-skills as “...*the ability to develop and use ICT within the context of a knowledge environment and associated competencies that enable the individual to participate in a world in which ICT is a requirement for advancement in business, government and civil society*”.

As with the definition, there are also various classifications of e-skills ranging from e-Literacy, Technological Literacy, Information Literacy to Media Literacy and professional ICT skills. After considering many sources, this study adopted the classification of e-skills shown in Table 1.

This classification was used by Mitrovic (2015) for mapping e-skills against the OGD considerations and identifying the place and role of intermediaries in this context. Table 2 shows e-skills required to address the identified OGD provision and usage considerations.

As shown in Table 2, the use of OGD for service delivery requires an awareness of the existence and benefits of OGD as well as the awareness of the required e-skills for an effective use of OGD. The beneficial use of OGD also requires basic e-literacy skills as well as data literacy, e-user skills and the astute approach to the technology and its application. In other words, insufficient data literacy and e-skills can affect the development of OGD agendas (Piovesan, 2017). However, all these skills are still unobtainable by the vast majority of people who need service delivery. For this reason, the involvement of a third-party (i.e. OGD intermediaries) is required.

Table1: Classification of e-Skills (Source: Mitrovic, 2015)

e-Skill	Description
<i>e-Awareness</i>	Relates to user's awareness of ICT and appreciation of the relevance of this technology in the information-based society. It is the capability to understand and adopt the lifelong-learning paradigm and the use of ICT as a medium to facilitate the individual or collective development of knowledge, skills and new capabilities in both social and professional life.
<i>e-Literacy Requisites</i>	Skills related to: (i) using hardware, software, networks and various ICT devices; (ii) identifying, accessing, organising, evaluating, interpreting, analysing, synthesising and applying information from all kinds of sources; (iii) understanding and dealing with the content in a variety of digital and non-digital formats.
<i>Data Literacy</i>	Skills related to finding, manipulating, managing, and interpreting data (including reading graphs and charts appropriately) and drawing correct conclusions from data in order to make informed decisions.
<i>e-User Skills</i>	Skills focusing on enhancing the efficiency of public and private sector knowledge workers.
<i>e-Business Skills</i>	Skills aimed at increasing organisational efficiency and productivity.
<i>e-Practitioners Skills</i>	Skills aimed at enhancing the capacity of public and private sectors to manage, support and service the ICT sector. A detailed description of these skills (the highest level of skills in this classification) can be, for example, found in the Skills Framework for Information Age (SFIA).
<i>e-Leadership skills</i>	Skills required to: (i) understand trends and impacts in the virtual environment; (i) develop appropriate organisational responses in order to maximise opportunities, efficacy and effectiveness; (iii) establish collaborative platforms within and across stakeholder boundaries; (iv) articulate needs and opportunities to increase understanding and commitment.
<i>E-Astuteness</i>	The capacity to continuously appropriate ICT and e-skills into personal work, education, business, social and family contexts in order to take personal advantage of the use of ICT and information.

The place and role of intermediaries in the OGD and e-skills context

The notion of ICT intermediaries came to the public domain in the 1980s. These intermediaries are seen as the parties positioned between data providers and users (Janssen & Zuidervijk, 2014) who help users access information that is publicly available by locating these resources, integrating various sources on a specific topic, structuring these findings into a form understandable by interested users and disseminating it back to them (Sein & Furoholt, 2012).

In the context of this study, intermediaries are seen as one of the key stakeholders in the OGD ecosystem. They can also be labelled as *users* of OGD since intermediaries are best suited to connect other two key stakeholders, namely: (i) government agencies and department, which can be regarded as the *providers* of the data; and (ii) citizens who require effective service delivery and who are considered as *beneficiaries* of OGD initiatives (Diani, 2013).

Table 2: Mapping e-Skills to OGD Considerations (Source: Mitrovic, 2015)

OGD Area of Consideration	Needed e-Skills
Open Government Data Provision	
Strategy and policy-making	<i>e-Awareness</i> <i>e-Leadership skills</i> <i>e-User Skills</i>
Data management	<i>e-Practitioners Skills</i> <i>Data Literacy</i> <i>e-Business Skills</i>
Quality aspect of data	<i>e-Practitioners Skills</i> <i>Data Literacy</i>
Standards	<i>e-Leadership skills</i> <i>Data Literacy</i>
Ecosystem	<i>e-Leadership skills</i> <i>e-Practitioners Skills</i> <i>Data Literacy</i> <i>e-User Skills</i>
Data Maturity	<i>e-Practitioners Skills</i> <i>Data Literacy</i>
Benchmarking and evaluation	<i>Data Literacy</i> <i>e-User Skills</i>
Issues and Challenges	<i>e-Leadership skills</i> <i>e-Practitioners Skills</i> <i>Data Literacy</i>
Barriers and negative sides	<i>e-Leadership skills</i> <i>e-Practitioners Skills</i> <i>Data Literacy</i>
Legal issues	<i>e-Leadership skills</i>
Open Government Data Usage	
Search and Access	<i>e-Awareness</i> <i>e-Literacy Requisites skills</i>
Interpretation	<i>e-Literacy</i> <i>Requisites Data</i> <i>Literacy</i>
Application	<i>e-User Skills</i> <i>e-Astuteness</i>

The role of OGD intermediaries is to create a symbiosis between the data itself, data providers and data users and beneficiaries. It is, however, obvious that these intermediaries must be e-skilled, possessing, at least, sound e-Literacy Requisite skills as well as Data Literacy skills.

Since data literacy in many developing countries such as South Africa is low, the continued advancement of open data intermediaries can be seen as a key area of capacity building in developing economies (Verhulst & Young, 2017). The absence of e-skills can severely impact on what people are able to do (Sen, 1980) and will thus inevitably contribute to a widening of the Data Divide chasm, which is represented as 'OGD e-Skills Related Gap' in Figure 1.

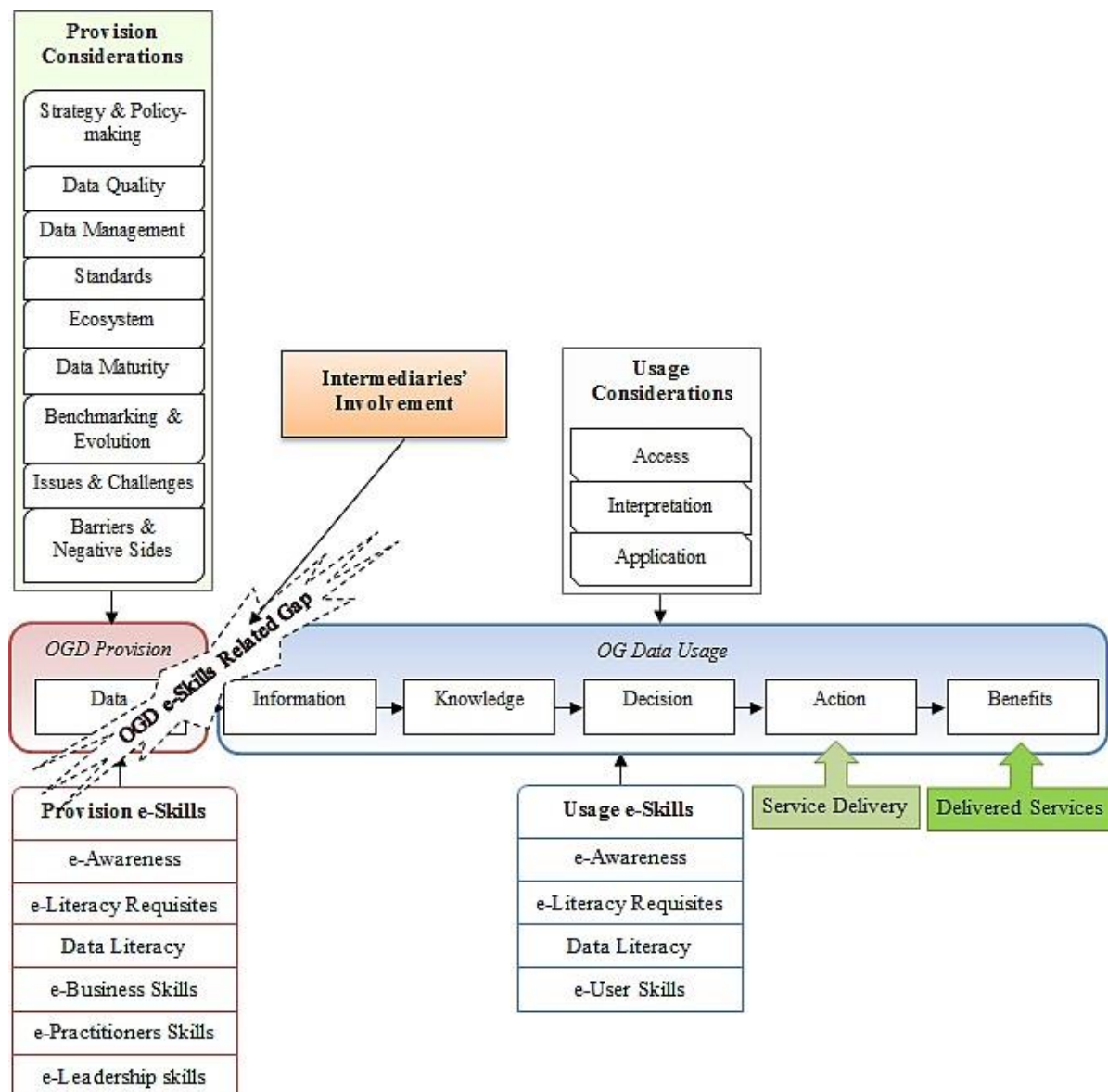


Figure 1: Intermediaries e-skills bridge for effective service delivery (Source: Authors, based on Mitrovic, 2015)

To avoid the widening of the Data Divide chasm, the role of intermediaries possessing the requisite skills to convert data into information is seen as very important. For example, Davies (2014) argues that “...most open data initiatives are designed in a way that end-users either need technical skills or need to rely on an intermediary, in order to extract information from datasets”. Converting complex numerical data into easily comprehensible visualizations is an example of intermediaries helping ordinary citizens to use OGD for the benefit of influencing service delivery (Verhulst & Young, 2017). The KZN e-Skills CoLab, which refers to “comprehensible visualisations” as cognitive data recognise that cognitive data achieves knowledge transfer in a far more intuitive manner than equations and graphs and has created a course towards the achievement of this goal.

Following the exploration of the role of OGD intermediaries in South African universities, Van Schalkwyk et al. (2014) found that universities can play an important role in the OGD ecosystem by: (i) increasing the accessibility and utility of data; (ii) assuming the role of a ‘keystone species’ in a data ecosystem; and (iii) having the potential to democratise the impacts and use of open data.

The real-life role of intermediaries in unleashing value from open data is brilliantly illustrated

through the story of the Medicine Price Registry Application (MPRApp) used in South Africa, which was enabled by South Africa's legislative framework that promotes and enacts transparency in medicine pricing. Such a framework compels the Department of Health to collect and publish data on medicine prices in South Africa, ensuring that the supply side of the MPRApp will continue to be made accessible, thus allowing the intermediary organisation 'Code for South Africa' to focus on improving the tool and getting it into the hands of its intended users (Verhulst & Young, 2017). Using trust that has already been built with their patients (social capital), doctors and pharmacists were able to help by alerting citizens (read patients) to the database and the potential for identifying much cheaper generic drugs to treat their ailments.

Intermediaries e-skills related policy implications

This study has shown that the OGD intermediaries are a necessity if we are to overcome not only the resource disparity between affluent and disadvantaged communities, but also being able to help and equip such community members with e-skills that will help them to make sense of OGD and, hopefully, positively affect their lives. With the support of intermediaries, which are able to develop new skills and tools, aimed at translating raw data into information for a broader constituency (UN, 2014), citizens, particularly those in need of service delivery, will become better informed about the value, influence and latent power of OGD.

The OGD intermediaries will also help in raising the awareness among citizens about both OGD and e-skills required for an effective use of OGD for service delivery. The increased awareness can motivate citizens to become involved in and support advocacy initiatives related to joint OGD and e-skills interventions.

Furthermore, not only will OGD intermediaries help citizens in making sense of already provided OGD and sharing this information with wider public (Halonen, 2012), they will also assist in determining the needs of future OGD (Davies, 2014; Nugroho, 2013). In this regard, Mitrovic (2015) has suggested that the role of intermediaries does not end with the use of the provided and demand for future OGD – the role of intermediaries can be extended to assist in the e-skilling of OGD beneficiaries with the biggest need for service delivery.

However, in order to provide OGD-related skills to a very large number of citizens in South Africa, a more systemic approach is required. Since this task is voluminous and too complex for solitary work of government, business or civil society ('in-silo approach'), the adoption of a multi-stakeholders collaboration model described in the South African National e-Skills Plan of Action (NeSPA 2010, 2013) is required. Other reports on OGD also suggest that such a complementary, coordinated method that involves many stakeholders is likely to yield higher returns (Tanriverdi & Ruefli, 2004; Kuk & Davies, 2011). Therefore, it can be concluded that an amalgamation of OGD stakeholders, including OGD intermediaries, is likely to effectively influence the beneficial use of OGD for service delivery.

Furthermore, intermediaries that are trusted by actors in different networks (such as doctors and pharmacists that have already been mentioned) are able to bridge discreet networks thereby creating new linkages. Intermediaries are, therefore, regarded as a proxy for enhancing social capital (Van Schalkwyk et al., 2016; Verhulst & Young, 2017) and, in turn, social cohesion (Mitrovic, 2010). This corresponds with the NeSPA (2013) recommendation for *"the use of ICT and e-skills for connecting people and helping them to maintain and strengthen social ties between family members, friends and communities; assessing the appropriation of e-skills for participation (e.g. e-Participation and e-Democracy), which has an important contribution to make in the evaluation of the readiness of individuals and communities to cohesively support the national, provincial and local development agendas"*.

On the same topic, Thakur (2015) suggests that e-voting, which uses technology to capture

and tally the votes, requires a change in the law and a huge initial capital injection. This may be a long way off, considering the relatively peaceful and scandal free elections, which took place under unfavourable economic conditions of a recession. However, Thakur & Singh (2017) suggest that e-participation is an enticing engagement method to recreate Town Square democracy using pervasive mobiles, by offering e-referendums which may well re-engage and involve citizens. As previously alluded to, this participative decision making model reinforces democracy and reduces hierarchy and bureaucracy.

Mitrovic (2015), however, warned that OGD intermediaries cannot be a substitute for e-skilling citizens for beneficial use of open data, in general, and OGD, in particular. If not considered temporal, there would be a risk of intermediaries doing the work 'for' or 'to' the beneficiaries, rather than helping them to do it by their own (Twidale, Blake & Gant, 2013). The concern of 'doing for' also includes possible bias or unintentionally inaccurate interpretation of data by intermediaries.

In the South African e-skills context, it is also recognised that *"in democracies and in most centrally managed societies, no amount of provision (doing to), or support (doing for) can succeed without a social, cultural and economic contract (doing with)"* (NeSPA 2013). As further elaborated in NeSPA (2013), *"at the centre of this contract lies individual and collective capability to maximise current circumstances in ways that are responsive to both: current and future individual and collective needs"*.

Intermediaries, hence, should only be an initial go-between, bringing communities into knowing and learning about the OGD agenda. In this relationship, the role of intermediaries should be to help citizens build the capacity to use and extract on their own value from OGD. In other words, OGD intermediaries should not be a substitute for e-skilling citizens but rather a party that helps citizens to become independent in accessing, adopting and appropriating open data of any kind.

Conclusion

Being an integral part of OGD ecosystem, intermediaries represent an important link between the providers of OGD, provided OGD and beneficiaries of this initiative, particularly those in need of service delivery. Since these vulnerable communities do not have requisite skills to make sense of OGD on their own, they have to rely on intermediaries to assist them to positively influence service delivery. On the other hand, these intermediaries should possess certain e-skills and social influence (social capital) in order to perform their role as assistants. Furthermore, OGD intermediaries can be a catalyst in the e-skilling of the wider population group. However, for that to happen, certain policies that link e-skills and OGD initiatives must be put in place. In that regard, we have provided several suggestions that might help the policy-makers to amalgamate these two initiatives in South Africa.

Reporting only on a part of the wider study, this paper solitary brings an embryonic discussion on the topic. Therefore, we suggest that the topic is explored further in order to increase generalisation and reach of this study.

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BIOGRAPHY



DR ZORAN MITROVIC is an ICT professional, academic and author specializing in: Information Systems Management (strategies, achieving business benefits); Cybersecurity Management: organisational strategies and policies, board concerns, cybersecurity risk management, awareness campaigns, insider threats, capacity building programmes, national strategies and policies; e-Skills/e-Competences development (National, organisational); e-Government; and ICT4D. Among other qualifications, Dr Mitrovic holds a DTech (Informatics) from the Cape Peninsula University of Technology and an M.Com (Information Systems) from the

University of the Western Cape. Dr Mitrovic has worked in various capacities in both the private sector and academia. He is currently the Director: Business Advancement and Advisory at VM Advisory as well as Director: Research and Advisory Mitrovic Development and Research Institute. Dr Mitrovic is also affiliated to the Durban Institute of Technology as a Research Adjunct.



DR SURENDRA THAKUR (COLIN) completed a DTech in Information Technology, of which his research focused on “System Architecture for Secure Mobile Internet Voting”. Additionally, Dr Thakur has presented various papers with reference to RFID and has received the Best Paper Award at the DUT Informatics Conference in the years 2007 and 2008. Colin has served on many executive forums over the years such as EXCO, SENATE, Faculty Board, etc. He was also the National Treasurer of the Computer Society of South Africa (CSSA) for a year, and later on the Chair of the KZN Computer Society of South Africa for three years, and Vice-Chairman for two years. Thakur was commissioned by the Electoral Commission of South Africa (IEC) to undertake an international study of electronic voting (e-voting) practices completed in 2012 called “Electronic Voting – the cross-national experience.” This was a comprehensive study of all countries trialing, piloting, implementing, using and then abandoning e-voting. He also evaluated the effectiveness Voter Registration practices with a particular focus on technology on behalf of the UNDP (2013). Additionally Dr Thakur has delivered 6 keynotes on this topic, wrote five papers and was an international observer in the 2011 Zambian election. He has observe two e-voting elections this year. He along with Prof Olugbara are developing a multimodal biometric voter validation system to leverage the ubiquity of mobile devices as a voting tool. Colin is currently the Director of the NEMISA KZN e-Skills CoLab at the Durban University of Technology which is tasked with e-skills in general, and particularly on the e-enablement of government services for effective service delivery, with a focus on e-democracy and e-participation. Dr Thakur has also conceptualized and introduced InvoTech, an innovation incubator at DUT, where one of his patents is being registered.



MS MYMOENA ISMAIL is the current Chief Executive Officer of NEMISA (National Electronic MEDIA Institute of South Africa), a non-profit education institution responsible for the development of e-skills human capacity in South Africa. Ms Ismail has a long history with developing e-skills human capacity in South Africa and her previous roles include being Chief Director at the then-named Department of Communications’ e-Skills Institute. The work of the e-Skills Institute resulted in the concept launch of the Ikamva National e-Skills Institute (INeSI) in February 2014. This is the first national catalytic organisation in South Africa. The model was endorsed by the ITU (United Nation’s International Telecommunications Union) and recommended to 55 countries. Ms Ismail’s work included a leadership role for: the establishment of 6 provincial collaborative e-skills knowledge production and coordination CoLabs; the establishment of a national Research Network for e-skills; multi-stakeholder collaboration with the national curriculum development and training working group; and the delivery of National Curriculum and Competency Framework policy document (NCCF). In 2015, Ms Ismail was CEO at the Cape Digital Foundation, a not-for-profit and non-governmental agency that focuses on capitalising the development of digital infrastructure (broadband) as a means to bring about a connect economy. Ms Ismail has a M.Com Information Systems (University of the Western Cape) and is currently working towards her PhD.

ESTABLISHING A HEALTH INFORMATICS RESEARCH LABORATORY IN SOUTH AFRICA

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ABSTRACT

Aim/Purpose	The aim of this project was to explore models for stimulating health informatics innovation and capacity development in South Africa.
Background	There is generally a critical lack of health informatics innovation and capacity in South Africa and sub-Saharan Africa. This is despite the wide anticipation that digital health systems will play a fundamental role in strengthening health systems and improving service delivery
Methodology	We established a program over four years to train Masters and Doctoral students and conducted research projects across a wide range of biomedical and health informatics technologies at a leading South African university. We also developed a Health Architecture Laboratory Innovation and Development Ecosystem (HeAL-IDE) designed to be a long-lasting and potentially reproducible output of the project.
Contribution	We were able to demonstrate a successful model for building innovation and capacity in a sustainable way. Key outputs included: (i) a successful partnership model; (ii) a sustainable HeAL-IDE; (iii) research papers; (iv) a world-class software product and several demonstrators; and (iv) highly trained staff.
Findings	Our main findings are that: (i) it is possible to create a local ecosystem for innovation and capacity building that creates value for the partners (a university and a private non-profit company); (ii) the ecosystem is able to create valuable outputs that would be much less likely to have been developed singly by each partner, and; (iii) the ecosystem could serve as a powerful model for adoption in other settings.
Recommendations for Practitioners	Non-profit companies and non-governmental organizations implementing health information systems in South Africa and other low resource settings have an opportunity to partner with local universities for purposes of internal capacity development and assisting with the research, reflection and innovation aspects of their projects and programmes.

Recommendation for Researchers	Applied health informatics researchers working in low resource settings could productively partner with local implementing organizations in order to gain a better understanding of the challenges and requirements at field sites and to accelerate the testing and deployment of health information technology solutions.
Impact on Society	This research demonstrates a model that can deliver valuable software products for public health.
Future Research	It would be useful to implement the model in other settings and research whether the model is more generally useful
Keywords	Health Informatics, Capacity Development, Living Laboratory, ICT4D

INTRODUCTION

Health information systems are one of the key pillars of a public health system (1). Developing countries in sub-Saharan Africa have unique environments in which limited infrastructure, lack of specialized technical skills and constrained financial resources impact on the development of national health information systems (NHIS) (2) (3). Consolidating currently fragmented health information systems in these countries into a coherent national information system will increase operational efficiencies, improve decision-making and lead to better health outcomes (4). However, engineering a coherent, effective and sustainable socio-technical enterprise information system of the scale and complexity of a national health information system (NHIS) poses unique and complex challenges in low and middle income countries (LMICs) (5) (6) (7) (8).

Specialized computer science skills are required to analyze and provide long term approaches for system design that cater for interoperability between the dynamic components in a continuously changing NHIS (9) (6) (10) (11). A systematic approach to high-level information system design at national level will also assist African Ministries of Health to better utilize resources available for independent projects implemented by donors, non-governmental organizations (NGOs) and universities (8). Many existing health information system components implemented in African countries are developed by foreign organizations using international donor funds and foreign software developers. Building local technical capacity and a sustainable system for rapid innovation in Africa is crucial to making full use of these investments.

The Health Architecture Laboratory (HeAL) was established and operated between 2011 and 2015 in the discipline of Computer Science in the School of Mathematics, Statistics and Computer Science (SMSCS) at the University of KwaZulu-Natal (UKZN) in Westville, South Africa. The aim of the HeAL project was to establish an advanced computing research laboratory in Africa, to develop African capacity and create a system of innovation and relevant technologies for an African environment.

The specific objectives of the HeAL were to: (i) establish an innovation ecosystem structure for rapid research, innovation and technology transfer; (ii) develop capacity in local implementation organizations by offering specialized Computer Science postgraduate degrees in health informatics to senior technical personnel; and (iii) conduct research in relevant technologies required for coherent, effective and sustainable national health information systems in sub-Saharan Africa. This paper summarizes and reflects on the major activities, experiences and outcomes of the HeAL.

METHODOLOGY

In order to achieve the above objectives, the following initial activities were undertaken:

- Developed a research agenda to guide and focus the activities of the HEAL and formulate selection criteria for research projects.
- Created a capacity development plan for recruiting and training highly skilled graduates and researchers in this area, which also informed the research agenda and *vice versa*.
- Developed a governance structure for the HeAL, including selection criteria, roles and guiding principles for the Student Selection Committee and the Scientific Steering Committee (SSC)).
- Evaluated (formative and summative) the operation and processes of the HeAL.
- Evaluated (formative and summative) the research and training of the HEAL
- Translated and transferred knowledge produced by the HeAL to appropriate communities.
- Established an outreach and collaboration strategy.

These activities served to guide the operation of the Laboratory in the first two years of operation. We adopted an action research approach to the development of the HeAL. Periods of development were followed by periods of reflection, in partnership with the Steering Committee, and thereafter incorporated into changes to the structure and functioning of the Laboratory.

An external evaluation of the HeAL was conducted by two independent South African academics. The evaluation team conducted site visits at both the HeAL at UKZN and its implementing partner, Jembi Health Systems. Faculty and staff participated in in-depth interviews and the team accessed various documents of the HeAL. The purpose of the evaluation was to determine the extent to which HeAL had met its grant objectives and then to consider: a) the impact of HeAL on its immediate institutional context; b) the impact of HeAL in a wider academic context; c) the contribution HeAL made to the development of participating students; and d) the benefit derived by partnering organizations participating in HeAL.

HEAL INNOVATION AND DEVELOPMENT ECOSYSTEM (IDE)

In order to realise its cross-cutting objectives, the Laboratory needed to establish strategic partnerships with implementing organisations and other research and academic institutions. A strategy and structure was required to effectively coordinate and leverage expertise from each partner. The Laboratory developed the HeAL Innovation and Development Ecosystem (IDE) model to manage the structural and functional evolution of the HeAL during its period of operation.

The final ecosystem model (Figure 1) describes the flow of innovation from the field environment (implementing partners) to the HeAL applied research environment where the ideas and requirements are researched and developed into specifications that, in turn, are productionized back into the field environment. The HeAL consolidated and formalised in Year One its partnership with Jembi Health Systems NPC (www.jembi.org) as a 'living lab'. At the time of the establishment of the partnership, Jembi was a newly formed innovation company spun out of the Biomedical Research Division at the South African Medical Research Council. Jembi's offices were based in Cape Town while, at that time, the HeAL was based in Durban, roughly 1650 km apart. The first two MSc students were employed as senior developers at Jembi, and were offered scholarships to buy out a portion of their time to work on their MSc projects. One of the students was based in the physical laboratory at UKZN and the other remained at the Jembi offices in Cape Town. Their HeAL MSc research revolved around Jembi's implementation projects in South Africa and Rwanda.

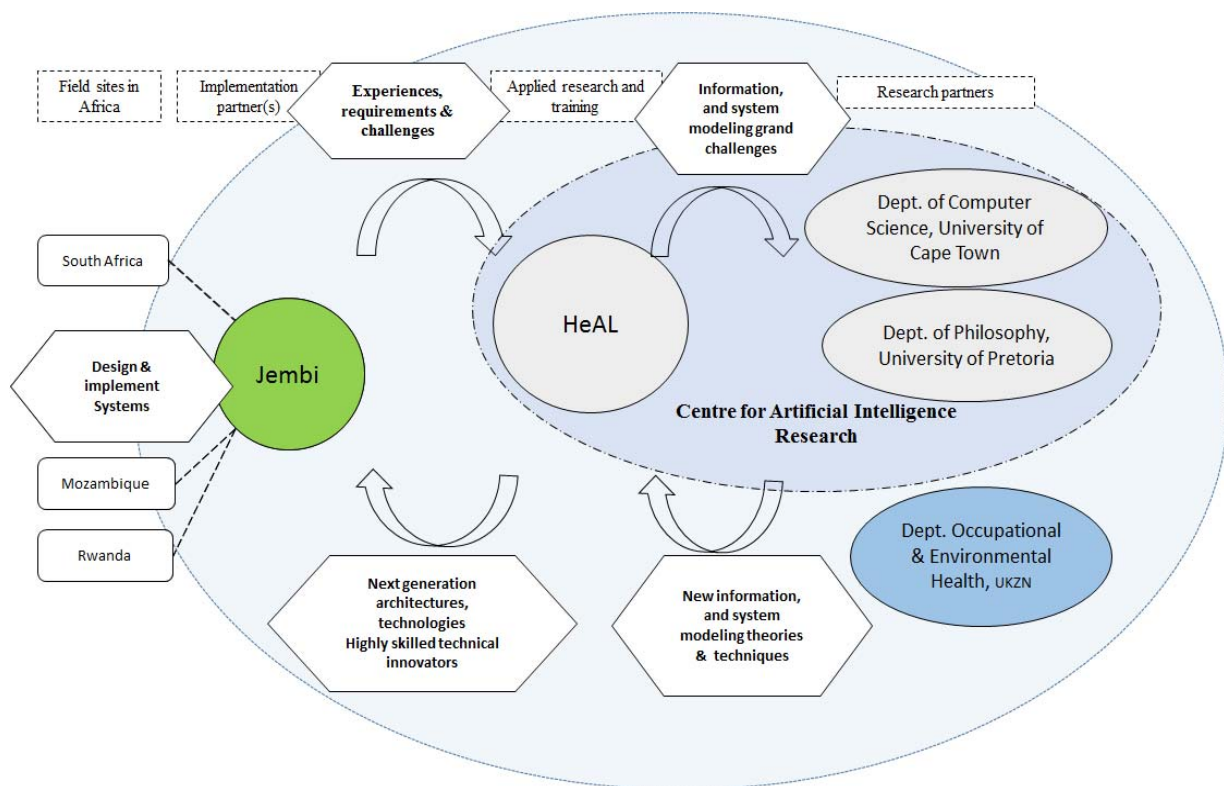


Figure 1. Version 3 of the Ecosystem Model

The Principal Investigator of the HeAL, a fulltime academic at UKZN, was appointed as a non-executive board member of Jembi, while the Founder and CEO of Jembi was appointed as an Honorary Associate Professor at the SMSCS at UKZN. The latest configuration, version 3, of the HeAL capacity and innovation ecosystem showing active research and development partnerships at the end of the project is shown in Figure 1.

HeAL is now situated within the Centre for Artificial Intelligence Research (CAIR), which has been expanded to a national research Centre in Artificial Intelligence and Computer Science, with research nodes at UKZN, University of Pretoria, North West University, Stellenbosch University and University of Cape Town. Through CAIR, collaborations have been initiated with the Department of Philosophy at the University of Pretoria and the Primary Health Care Directorate at the University of Cape Town.

EVALUATION OF THE INNOVATION MODEL

Research outputs

The HeAL's research was eventually consolidated into three research themes, namely:

- Innovation models for health information technologies in sub-Saharan Africa;
- Architectures for national health information systems; and
- Ontology based systems for knowledge capture and decision making.

Research theme 1: Innovation models for health information technologies in sub-Saharan Africa

The main output of this theme was the refinement and evaluation of the HeAL innovation ecosystem model. Innovation in health information systems engineering requires the collaboration of multiple partners that include research-led institutions such as universities and research organizations, stakeholder communities, open development communities and software development houses. The Laboratory sought to develop and refine a model that would involve these various communities, institutions and organizations and manage the sometimes conflicting interests and concerns.

An initial model was proposed in Moodley et al. (2012) (6). The efficacy of the model was demonstrated in the Laboratory's work in the development of the Open Health Information Mediator (OpenHIM; www.openhim.org) (12). The OpenHIM technology has had impact far beyond expectations and has seen several successful deployments and has spawned an international open-source community. Its success is in large part due to the application of the innovation model. Several other technologies were also developed to different levels of maturity.

Research theme 2: Architectures for national health information systems

Recently, several sub-Saharan African countries have begun the process of developing national health information systems. The architecture suitable for such large, complex systems, especially in low resource settings are still not well understood. Two MSc projects involved an investigation of architectures for NHIS; while the one project investigated high level approaches to NHIS development (8), the second project was focussed on the development and evaluation of a health information mediator for health information exchanges (12).

The first work characterized different approaches that countries could adopt to guide the development of their respective NHIS and evaluated the applicability of these approaches in LMICs before making recommendations that could guide Ministries of Health (12).

The latter project developed and evaluated the OpenHIM, a central component of the Health Information Exchanges. These exchanges have emerged as critical components of modern scalable and sustainable NHIS. This work resulted in the OpenHIM that has seen wide deployment and interest from a large international community (13) (14).

Research theme 3: Ontology based systems for knowledge capture and decision making

Since inception, HeAL has placed strong emphasis on applying the latest thinking and technologies emanating from computer science in the study of health information systems. In particular, it seeks the collaboration of researchers involved in knowledge representation and reasoning and ontology engineering. The development of formal conceptual models is important to deal with semantic inter-operability, access to knowledge and information about human health and understanding of complex adaptive systems, such as national health information systems. These models have potential to deepen an understanding of complex systems, improve the development of tools that support modelling and analysis of HIS and provide rigor in the engineering of such systems.

Innovation and technology development

A significant component of HeAL activities were related to the identification of technology gaps and the development of relevant technologies. Technology gaps were informed by:

- Current problems and projects at implementation partners
- Availability of students and access to field sites
- Skills and strengths of faculty

The following five technologies were initiated as technology demonstrators, one of which (the OpenHIM) has been developed further into a viable software product, in close association with Jembi:

1. OpenHIM: a central component of Health Information Exchanges that has seen multiple production deployments - Jembi.
2. A prediction tool for HIV antiretroviral drug resistance from clinical data: A completed research prototype was produced and contributed to the community - Jembi and the Africa Centre for Health and Population Studies.
3. An ontology and knowledge-based repository for structuring TB treatment adherence knowledge: A research prototype has been produced - HeAL in-house project.
4. An eHealth regulation ontology: A research prototype has been developed - Jembi and HeAL in-house project.
5. A framework for selecting and adopting an appropriate NHIS architectural approach in a sub-Saharan Africa country - HeAL in-house project.

The Open Health Information Mediator

OpenHIM is an open source software application that was initially developed as an MSc project in the HeAL. The OpenHIM was developed in partnership with Jembi to satisfy a requirement to strengthen interoperability between maternal health applications in Rwanda. A timeline showing the development of the OpenHIM is shown in Figure 2, below.

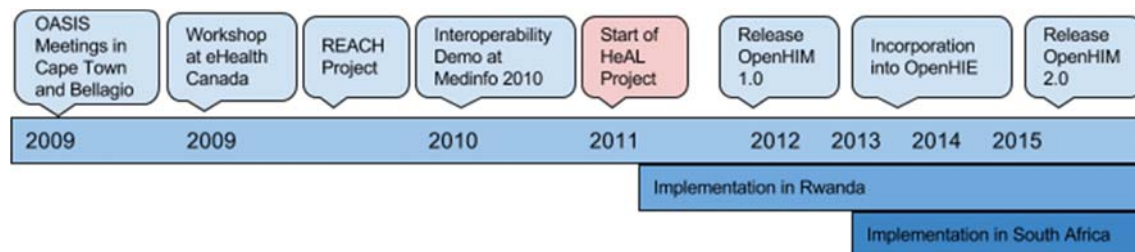


Figure 2 Timeline of the OpenHIM

The first version of the OpenHIM was implemented in the Rwamagana district of Rwanda where it is used to connect and collate information sent by SMS (Short Message Service) by community health workers to an antenatal care facilities using the Open Medical Record System (OpenMRS).

The OpenHIM was modelled on similar software developed in Canada (15). The OpenHIM was successfully deployed in Rwanda for maternal care. Following its early success, the OpenHIM has evolved into a very significant application that is currently being implemented widely as a health information exchange in South Africa at national and subnational level, as well as in other countries. The OpenHIM is also a core infrastructural component of the OpenHIE project that grew out of the Rwanda project. This is a very significant achievement

for a software component built in a university environment as open source software in such a short space of time and demonstrates the usefulness of the partnership between academia and private sector organisations. The OpenHIM is hosted as an open source software.

During 2014, the OpenHIM was refactored to make it more flexible and version 2 was released at the ICT4H conference in September 2014.

DISCUSSION

The innovation model demonstrated value to all partners. The main finding of the external independent evaluation was that: “HeAL not only contributed academic research, but also positively impacted the wider Health Information Systems space in South Africa by contributing models, tools and technologies that are useful for other organizations developing eHealth applications. HeAL also contributed towards the development of students through scholarships for postgraduate studies as well as supervision and teaching at Honours level.”

The HeAL innovation model provides a strategy for applying advanced theoretical and foundational computer science expertise to the health domain. We expect this to impact on projects designed to better understand health systems as complex adaptive systems and the effect of interventions on the effectiveness and equity of health service delivery

The Laboratory was highly successful with regards to the training of graduates at its main implementation partner, Jembi. The Laboratory has already trained three MSc and one PhD student in Computer Science.

The HeAL has also developed and continue to maintain a strong partnership with Jembi. HeAL played an essential role in building and strengthening Jembi, which is now recognized locally and internationally as a leader in interoperable Health Information Technologies (HIT) in Africa.

HeAL developed an effective ecosystem and platform, the HeAL Capacity and Innovation Ecosystem, for coordinating research, innovation and transfer of health information technologies in sub-Saharan Africa. The Laboratory experienced several challenges during the course of its operation, which provided opportunities for significant learning. Despite these challenges, the Laboratory successfully adapted and established the ecosystem and, via its strong partnerships, has had a substantial influence on health information technology policy in Rwanda, Mozambique and South Africa. The Laboratory also plays an important role in the international OpenHIE community. An external evaluation was also conducted on the HeAL project, which documents and reports the Laboratory’s influence at different levels.

LESSONS LEARNT, RECOMMENDATIONS AND FUTURE WORK

The HeAL project was highly successful in meeting its overall aim and major objectives. It successfully established an applied Computer Science research Laboratory at the University of KwaZulu-Natal. The lab is now embedded in the Centre for Artificial Intelligence Research which ensures its sustainability and exposes it to new partners and elevates its potential influence and impact in South Africa. It successfully introduced and evolved an innovation ecosystem which harnesses and coordinates the strengths of academic, research and implementation partners to create a sustainable system for rapid innovation for health information technologies in Africa. Its key technology output, the OpenHIM, is deployed at multiple sites in Rwanda and South Africa and is recognized as one of the foremost solutions for interoperability for health information exchange in Africa. In terms of capacity development

it graduated two highly specialised and talented postgraduate students who are playing leadership roles in the health information space.

Jembi grew substantially during the Laboratory's operation and is now recognised as a leading technology organisation in interoperability solutions for health information technology in Africa. The Laboratory played an important role in Jembi's growth and development.

In terms of the research question: "Can an applied Computer Science research lab in a sub-Saharan African university facilitate and enable local capacity development and sustainable innovation of relevant health information technologies?", our findings show that despite several challenges this is not only possible but important for a sustainable system of innovation for HITs in Africa. A key output of the Laboratory, the HeAL innovation ecosystem, has already been used to deliver and deploy an integral technology solution for interoperability.

Despite some challenges, the results from HeAL indicate that the innovation model is a powerful and resilient approach for harmonizing different research and development efforts around global health IT problems and an implementation-driven approach that tightly binds the work to real needs.

ACKNOWLEDGEMENTS

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BIOGRAPHY



PROF DESHENDRAN MOODLEY is currently serving as an Associate Professor at the University of Cape Town. His research interests revolve around developing large scale intelligent architectures, specifically to investigate how ontologies, belief networks and software agents can be used in such architectures. Prof Moodley's qualifications include a PhD and an MSc in Computer Science, both of which were obtained from the University of KwaZulu-Natal.

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Position:



PROF CHRIS SEEBREGTS is the founder and the current Chief Executive Officer and eHealth Director of Jembi Health Systems NPC. Jembi is a non-profit company specializing in digital health, headquartered in South Africa, with country offices in Mozambique and Rwanda. Chris is also an honorary associate professor in the School of Mathematics, Statistics and Computer Science at the University of KwaZulu-Natal. Prof Seebregts has a PhD in Chemical Pathology from the University of Cape Town and postgraduate degrees in Computer science and Software Engineering from the University of South Africa. He has worked in the public and private sectors in biomedical and informatics research, information technology management and software development. He is part of the OpenMRS leadership and is recognized internationally as an expert in eHealth. Prof Seebregts has a vision for improved global health through the development of effective and efficient health information systems, growing partnerships and building local capacity in developing countries.

TECHNOLOGY DIFFUSION IN A RURAL UNIVERSITY IN SOUTHERN AFRICA

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ABSTRACT

Aim/Purpose	This case study examined the state of development and diffusion of the use of technology in a rural university in southern Africa.
Background	It has been demonstrated that while the levels of interest, utilization and motivation for the use of technology in the teaching practices of the academic community might be regarded as relatively high, there is evidence of a need for improvement, from both a pedagogical perspective and in the way educational technology is used to deliver course content. This case study also highlights opportunities for further improvement in some areas related to ICT services, where these services were being offered, such as in computer laboratories.
Methodology	Two surveys were used to assess the input from staff (109) and students (750).
Contribution	This study has identified the challenges and opportunities that might exist when promoting the use of technology in a teaching and learning environment of a rural South African university.
Findings	The findings illustrated a continuous growth in use of the Learning Management System (LMS). However, access to technology proved to be a major concern since 92% of student respondents indicated that they had to wait for access to a computer. In addition, the study found that there is a perception amongst some academic staff members that UL students have their own devices which they use for accessing online content. The study showed that 92% of the students are reliant on the Computer Labs for accessing computers. Eighty percent of the academic community who responded to the questionnaire use the University's LMS. The biggest factor influencing technology adoption was found to be Student Encouragement (35%). The fact that 23% of staff respondents use technology for self-development purposes and only 22% use technology on their own accord is indicative of very low interest levels among academic staff members in the use of technology for teaching purposes. Such paltry interest levels in the use of technology have implications for the eLearning support team who have been given the mandate to promote and motivate for effective use of eLearning. In addition, very few staff respondents in this study indicated their willingness to include multimedia content in their courses, with only 9% using sound, 12% using video, 15% using discussion forums and 15% making interactive content available to students.

Recommendations for Practitioners	Useful tips recommended for LMS administrators include finding a way that enables course development prior to the commencement of the registration process as well as providing a facility that links Blackboard with the University's admin system for capturing results that are stored in LMS.
Recommendation for Researchers	It is suggested that this study be continued over the next few years to enable the examination of specific trends and evaluation of improvements.
Impact on Society	As outlined in the National Development Plan (NDP), the use of technology in rural parts of South Africa is of major priority. Therefore, it is envisaged that findings from this study will provide a direction for the successful implementation of technology diffusion in the teaching and learning environments of rural communities.
Future Research	Further research is required in order to explore the reasons behind some of academic members of staff and students not using the University's LMS.
Keywords	Teaching and Learning, Technology, Rural Community, Learning Management Systems (LMS)

INTRODUCTION

This report outlines the way technology is used to promote teaching and learning at the University of Limpopo (UL). In particular, findings emanating from two survey questionnaires that were distributed during 2016 amongst academic staff and students are analyzed. The aim of the survey was to evaluate the effectiveness of the tools that are available to the academic institution from the perspective of academic staff members and students.

BLACKBOARD USE AT UL

An analysis of active Blackboard user participation for the years 2010 to 2016 indicates a gradual and steady increase in the level of adoption of Blackboard by the UL users. The increase is depicted graphically in Figure 1. For example, 17,127 active users of Blackboard were recorded in 15 March 2017. A year later in 2016, active user participation had increased by 716 to 16,337.

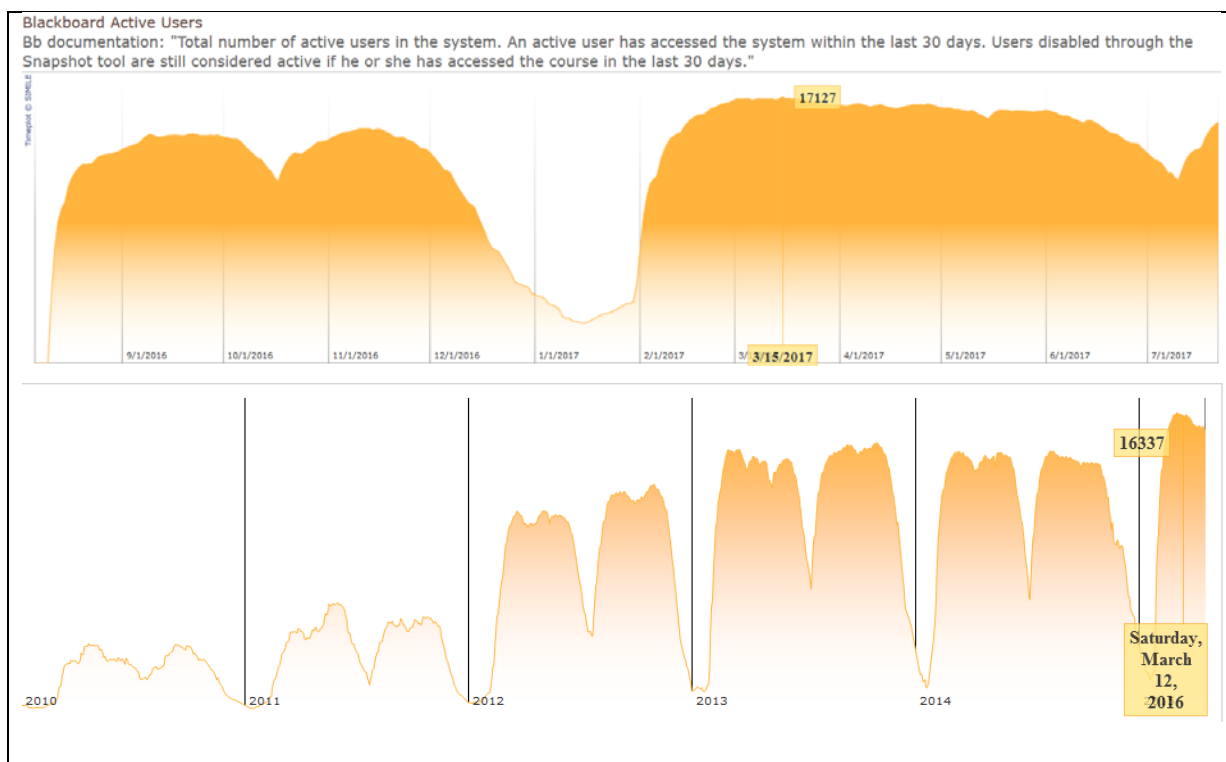


Figure 1 – An illustration of active Blackboard user participation drawn from UL's Learning Management System (LMS)

SURVEY RESPONSE OF STUDENT'S USE OF BLACKBOARD

In 2016 a questionnaire was sent to all the students of UL with the aim of evaluating the effectiveness of the University's online learning management system (LMS) called Blackboard. A total of 790 responses were received. However, due to limited access to computers, most of the respondents consisted of first year students who were taking a computer literacy module. The respondents were mostly from the Faculties of Science and Agriculture and Humanities and were encouraged by their lecturer to complete the questionnaire.

The distribution of respondents according to gender and faculty is indicated in Figure 2. To make the study much more representative, a far much better distribution of respondents spread across all four faculties should ideally be achieved. Attempts will be made to address this limitation in future surveys.

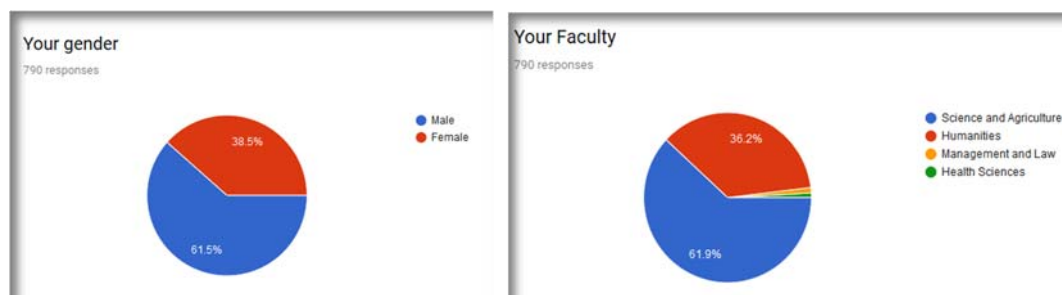


Figure 2: Distribution of respondents according to gender and faculty

The year of study and age distribution of the respondents are reported in Figure 3. It is noteworthy that over 95% of the respondents were less than the age of 25.

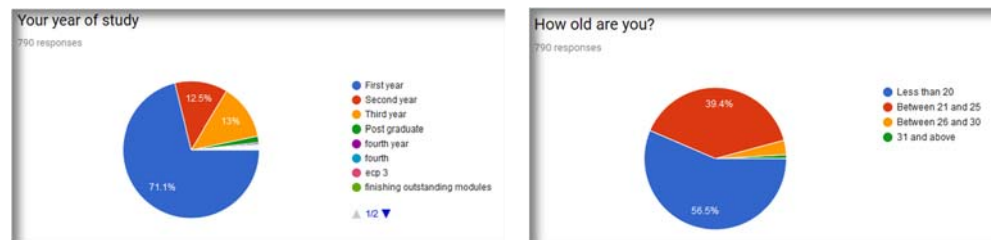


Figure 3: Year of study and age analysis

ACCESS OF ICT FACILITIES BY STUDENTS

A series of questions were designed to determine the ease with which students are able to access computers and the internet.

It is commonly acknowledged that internet plays a pivotal role in the ability of the students to access relevant and up-to-date information, which they use in their studies. In this study, as shown in Figure 4, 17.4% of the 788 respondents indicated having difficulty accessing the internet. The remaining 82.6% of the respondents found the internet to be accessible to very accessible.

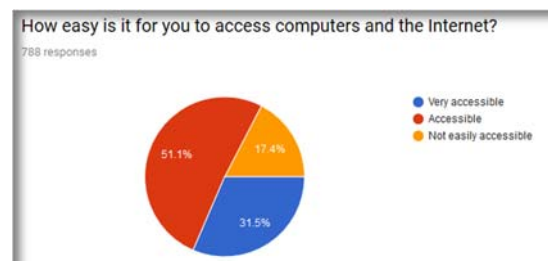


Figure 4- Ease of internet access

Whereas an overwhelming majority of respondents have easy access to a computer and the internet (see Figure 4), an alarming 92% indicated having to wait for a computer to become available (Figure 5).



Figure 5 - Ease of access to a computer in computer labs

As illustrated in Figure 6, nearly all of the student respondents (92%) are reliant on the University's computer labs to access Blackboard.

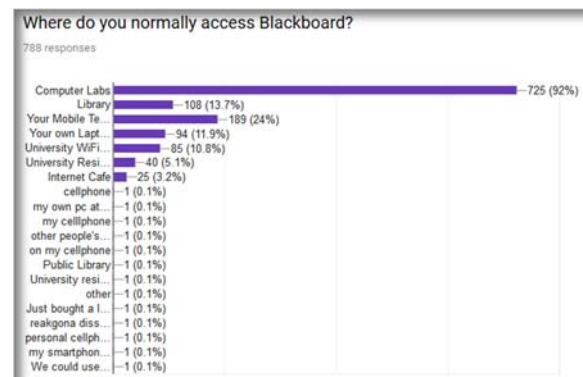


Figure 6 - Blackboard access locations

STUDENTS' LEVEL OF DIGITAL LITERACY

Figure 7 shows increased awareness (31%) in terms of the students being familiar with the use of computers prior to them studying at UL as compared to previous similar studies that were conducted in 2009.

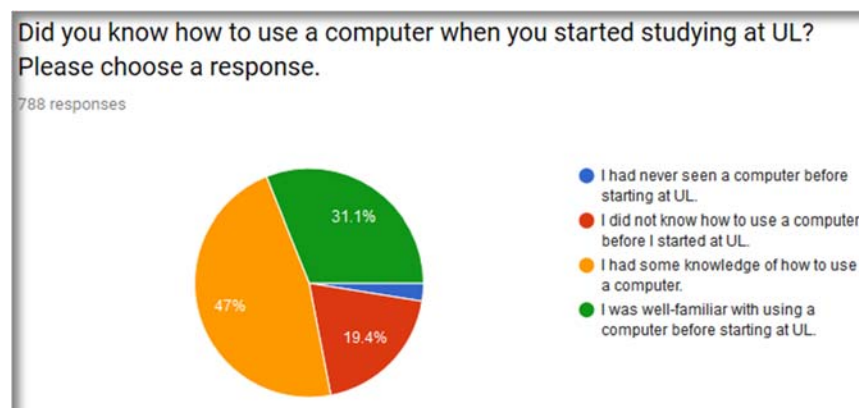


Figure 7: Level of computer literacy prior to starting at UL

Despite 2.5% of student respondents having not seen a computer and 19.4% not knowing how to use a computer when they started at the University (see Figure 7), 86% of the respondents still found it easy or very easy to use Blackboard (see Figure 8).

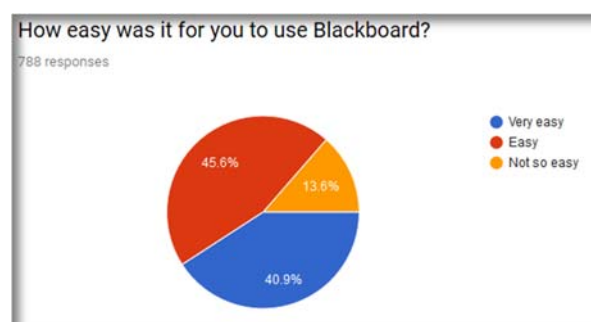


Figure 8: Ease of use of Blackboard

Do you feel you needed more training when you first started using Blackboard?

788 responses



Response	Percentage
Yes	37.3%
No	62.7%



According to Figure 10, Blackboard is used mostly for reading announcements (90%), reading course material (86%), Quizzes (76%), tests/exam (80%) and submitting assignment (72%).



Do you use discussion Forum?

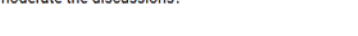
783 responses



Response	Percentage
Yes	82.5%
No	17.5%

IF the answer to the previous question is yes, does the lecturer participate/moderate the discussions?

142 responses



Response	Percentage
Yes	58.5%
No	41.5%

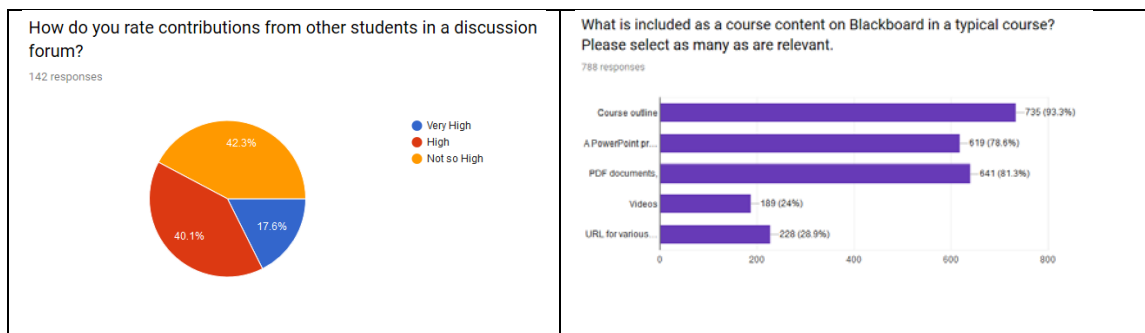


Figure 11 - Areas of User within Blackboard (2)

As shown in Figure 12, students found the most useful feature of Blackboard to be its ease of access to the course content (78%) followed by increased availability (74%).

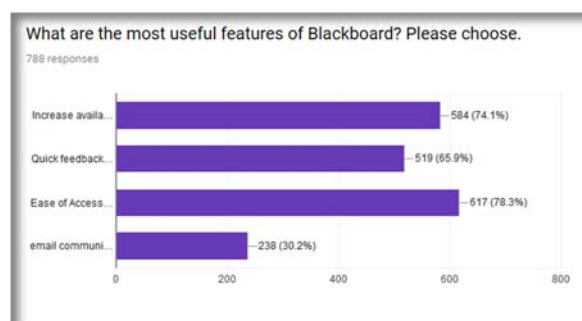


Figure 12: Students view of Blackboard's most useful features



Figure 13: Email Communication with a lecturer

It is clear from Figures 13 and 14 that nearly all the students who participated in the survey (98%) found Blackboard a useful or very useful tool.

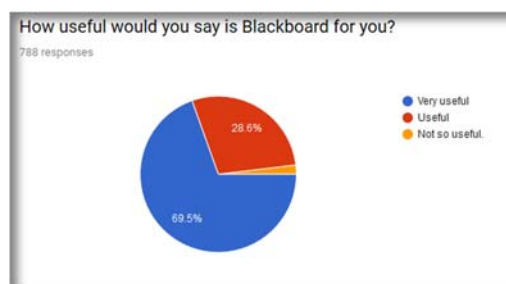


Figure 14: Student's view of the overall usefulness of Blackboard

SURVEY RESPONSE - USE OF BLACKBOARD BY ACADEMIC COMMUNITY

A communication from the Deputy Vice Chancellor of the University addressed to academic staff provided a link to the questionnaire requesting academic staff to respond. As shown in Figure 15, 107 participants from all four faculties took part in the survey.

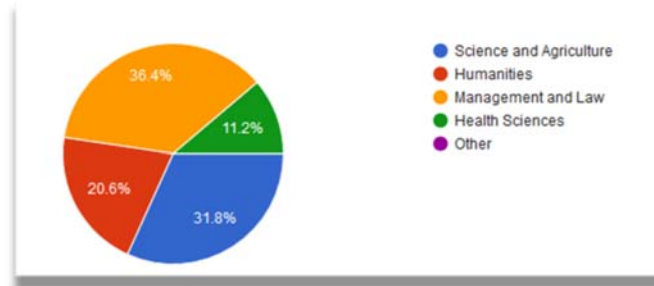


Figure 15: Faculty participation in the questionnaire

Out of the 107 academic staff members who participated in the survey, it was established that nearly 80% were using Blackboard (Figure 16).

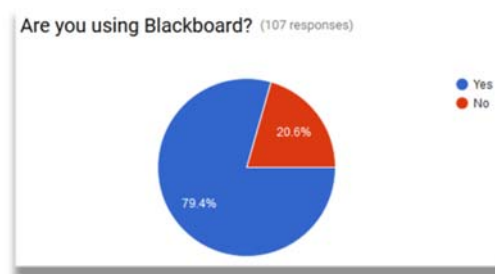


Figure 16 - The percentage of staff members using Blackboard

Figure 17 displays reasons why 20% of the participants who responded do not use Blackboard. It is interesting to note that 71% of the respondents indicated “Other” as the reason why they do not use Blackboard. This might be the subject for further future research.

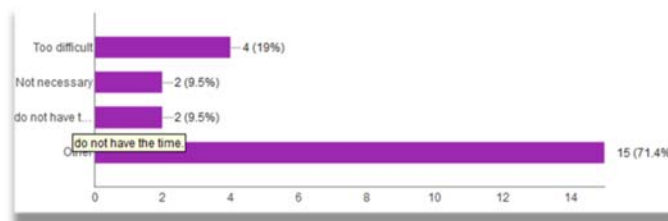


Figure 17 - Reasons why some users are not using Blackboard

LEVEL OF EXPERIENCE OF BLACKBOARD USERS

The level of experience of the respondents in terms of their use of Blackboard is illustrated in Figure 18. About 70% of the participants indicated that they had been using Blackboard for more than a year.

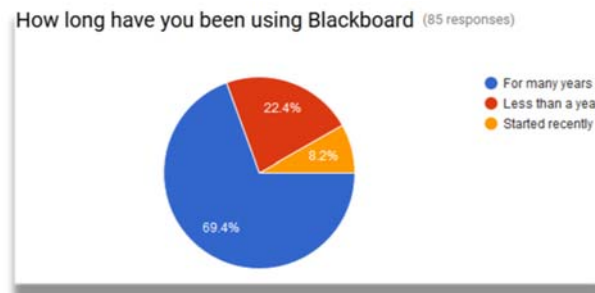


Figure 18: Level of experience in the use of Blackboard

MAIN REASONS FOR TECHNOLOGY ADAPTATION

The main reasons given by staff respondents for using Blackboard are depicted in Figure 19. The highest number of participants (35.3% of the 85 participants) attributed their use of Blackboard to encouragement by their students. This is in agreement with our experience when conducting technology training sessions, where lecturers often divulged the reason for their attendance of the training sessions was based on the fact that students demand their presence on Blackboard.

The second best reason (22% of the participants) given by respondents for using Blackboard was self-development. Whereas a fairly high number of participants (22.4%) made the decision to use Blackboard without any outside influence, a mere 17.6% were influenced by a Faculty/School management decision.

More than half of those responded (56.5%) gave "Other Reasons" for using the University's LMS. This is something that will need to be delved into in future surveys.

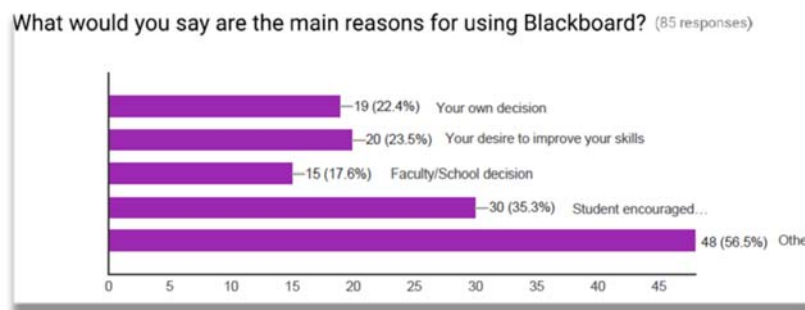


Figure 19 - Motivation for using Blackboard by the academic members of staff

Levels of Satisfaction and Comments

The level of satisfaction regarding the use of Blackboard is illustrated in Figure 20. Just over 2% of respondents said that they were not satisfied with using Blackboard. The remaining 98% were either very satisfied or satisfied.

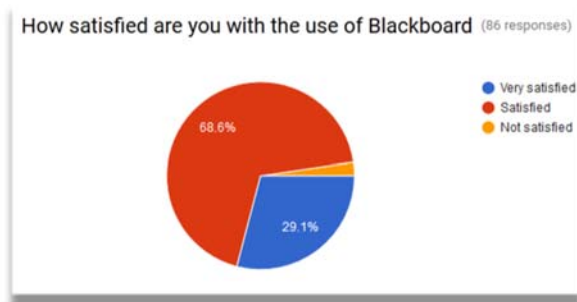


Figure 20: Level of satisfaction with respect to the use of Blackboard

ASPECTS OF COURSE CONTENT DESIGN

Features that were included by the respondents in their content as part of their course design are illustrated in Figure 21.

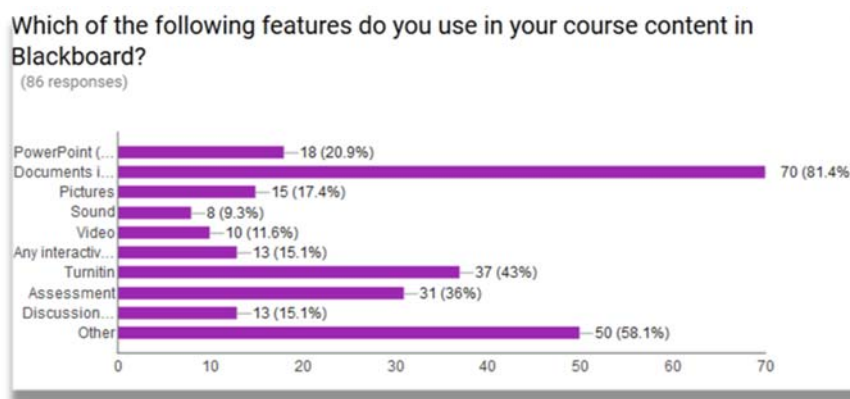


Figure 21 - Content type usage in the courses offered by the academic community

As illustrated in Figure 21, most respondents (81%) use Blackboard for storing documents and other uses (58%). Other notable uses include Turnitin (43%), assessment (31%), pictures (17%), interactive activity (15%), videos (12%) and sound (9%).

HELPFULNESS TO STUDENTS AS STATED BY THE LECTURERS

Finally, the last question was aimed at determining the extent to which Blackboard assist students academically and the responses are illustrated below in Figure 22.

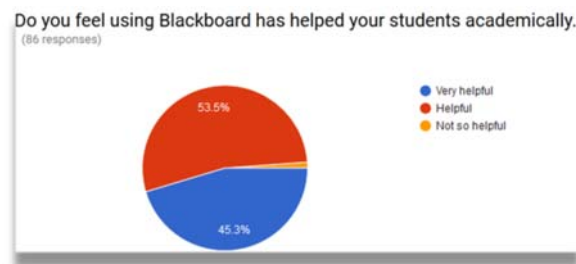


Figure 22 - How academics feel technology use can assist the learning process of students

The concluding question provided an opportunity for respondents to make recommendations on ways in which service delivery could be improved. Results of this section have not been included here for purposes of brevity. However, the survey results can be accessed at:

<https://docs.google.com/forms/d/12b8OF1gf7yUtlS-VoYEJi2Lwvm934COjqzv6UV83zlo4/viewanalytics#responses>

DISCUSSION

The use of Blackboard at the University of Limpopo from 2010 has been demonstrated. According to Figure 1, in March 2017 17,127 of the 21,000 enrolled students (82%) had used the system at least once during the previous 30 days. However, ease of access to the technology has proven to be a major concern (Figures 4 and 5) since 92% of student respondents had to wait to access a computer. This situation obviously needs to be addressed as a matter of urgency. In addition, there is a perception amongst some academics that UL students have their own devices for which they use for accessing online content. Figure 6 shows that 92% of the student respondents are reliant on the Computer Labs for accessing computers. Figure 9 highlights the need for basic computer literacy training for selected first year students before they can use Blackboard. Figure 16, shows that 80% of the academic staff respondent are using Blackboard. These findings are in agreement with the stance that eLearning initiatives are becoming ubiquitous in higher education (Bichsel, 2013). The findings also compare favourably with the findings of a study undertaken in Europe (Gaebel, Kupriyanova, Morais, Colucci, 2014), where 82% of the institutions surveyed offer online learning one form or another. Bichsel (2013) has additionally shown that nearly all institutions of higher learning have a major interest in the provision of eLearning. The question is whether the use of technology is capable of enhancing the learning process for students and which areas of improvement with respect to the delivery of learning service could be implemented.

Figure 16, also shows that 21% of the academic respondents are not using Blackboard. Of this group, 15 individuals or 71% fall within the category of other as shown in Figure 17. An in-depth study aimed at identifying the reasons why some academics do not use Blackboard is therefore required.

The reasons provided by the respondents for using technology (Figure 19) deserve some attention. Zappa et al. (2009) believe that student-centred learning environments necessitate the application of active learning strategies to classroom teaching that, for example, involve student presentations, small group problem solving, self- and peer-evaluation and group discussions. As shown in Figure 19, the biggest factor influencing technology adoption is Student Encouragement (35%). In a study undertaken by Volery and Lord (2000), the authors claim that the demand for e-learning based courses by university students is increasing.

The fact that only 23% of the respondents indicated that they use technology for their own development and only 22.4% indicated that their use of technology came about as a result of their own

decision, is indicative of a very low level of real interest by academic staff in the use of technology for teaching. This has implications for the eLearning support team that has been given the mandate to promote and motivate for effective use of eLearning. These results correlate with findings illustrated in Figure 1, which show that the highest level of usage in terms of content is attributed to providing documents online (81%). Text is the most common form of information in almost all interactive multimedia programs intended for learning (Alessi and Trollip, 2001). The use of video has opened many opportunities in educational multimedia (Alessi and Trollip, 2001). Sound, especially speech, is increasingly important for educational multimedia. Evolving hardware and software attributes will surely permit users to employ more adaptive and non-linear interactions, and a higher capacity for differentiating audio and visual presentations (Mann, 1995). However, in this study, very few staff respondents indicated their willingness to include multimedia content in their courses, with only 9% using sound, 12% using video, 15% using discussion forums and 15% making interactive content available. It appears, therefore, that the primary reason behind the use of the technology is online loading of documents and notes. Web course tools (e.g. static and dynamic Web pages, threaded discussion groups, e-mail, chat, instant messaging, streaming media/video, animations, application sharing and IP audio/video conferencing) are increasingly being adopted and used by teachers to optimize delivery of instructional material (Lindner and Murphy, 2001). Richards, Dooley and Lindner (2004) recommend using technology and the web's flexibility to create an active learning environment. Learning is a social process, so the interaction with the instructor and other students is important. Murshitha and Wickramarachchi (2016) state that the key elements of learning processes are interactions among the students themselves, the interactions between faculty and students and the collaboration in learning that results from these interactions. Based on the findings of this study, however, the communicative and interactive features of technology are not being utilized to, for example, accommodate student learning styles, as indicated by the relatively low utilization of discussion, sound, images and videos. This notion is also shared by Kim et al. (2014), who believe that teachers are not necessarily prepared to apply new pedagogies or to support the expanded roles and responsibilities associated with student-centred learning.

Despite these limitations, there is a very high level of helpfulness that is attributed to the use of the tool by the respondents. Figure 22 shows that about 99% of the respondents found the tool helpful or very helpful. Such positive attitudes illustrate the potential impact that an eLearning environment could have on the teaching and learning processes if course content included more carefully selected and appropriate interactive elements (e.g. group discussions, videos, images and sound) are included as part of learning content, in order to stimulate the active learning required to promote attention, motivation and ultimately satisfaction (Keller and Suzuki, 1988), which are critical elements for accelerated learning. Such levels of satisfaction and helpfulness were also confirmed by the various comments attributed to the individual participants.

Useful information was acquired from comments made by 36 respondents. The respondents have mostly expressed their satisfaction with the service delivery but also indicated areas in need of improvement. These areas of improvement include: erratic network; air-conditioning that is not working; poor lighting; slow uploading of certain content (e.g. Turnitin) and occasional problems that are experienced with connection or editing.

Blackboard administrators may find the following recommendations useful:

- i. Find a way to enable course development before the registration process begin; and
- ii. Providing a facility that links Blackboard with the University's admin system for capturing results that are kept in Blackboard.

The comments on the degree of technology's helpfulness, which were received from the respondents, was very positive and shows that there is potential for a much more mature process to be developed. The received comments generally indicated a positive attitude towards the use of technology and a willingness to make more use of non-traditional content, such as videos, images and discussions, which can improve the quality of teaching and learning. The comments also provide useful and constructive information for the eLearning team that will enable the team to

provide better service by identifying areas in need of improvement. For example, one respondent recognized the inadequacy of facilities by indicating that, at times, there are not enough PCs for students to undertake assignments.

CONCLUSION

In this study, it was established that academic staff members at a rural Southern African university to a greater extent uses technology when compared to other universities globally that show a similar degree of interest. There are clear opportunities to improve content for improved students learning. The stage of development in terms of use of technology as shown by the study is at a very early level with overwhelming majority (71%) using the online environment for depositing documents and far fewer for interactive contents such video, sound and group discussions. This is similar with observations made by Kim, (2014), who found that teachers are not necessarily prepared to apply new pedagogies or to support the expanded roles and responsibilities associated with student-centered learning. However, in this case, the user community is not shy to acknowledge that it can improve the effectiveness of employing technology by including more pedagogically relevant features in online course content in order to improve the learning experience of the students. In summary, the outcome of this study provides useful feedback from the user community to enable the management of the eLearning unit to build the capacity required for eLearning to evolve and mature as part of the educational change process, so that the institution achieves its goal of an improved system of higher education (Laurillard, 2006). The study highlighted the fact that there is a minority group (20%) of the respondents who did not use Blackboard. Further investigation into the reasons for this situation could lead to new and useful clues for improvement in service delivery. In addition, it is clear that a number of infrastructural challenges need attention.

The most alarming finding of the study relates to the keen interest of students who would wish to use ICTs for their academic progress on one hand and inadequate facilities which this study shows students (92%, Figure 5) having to wait for access to a computer in a Computer Lab.

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ABSTRACTS

WOMEN AND ICT: GOING BEYOND THE 'USUAL [DIGITAL INCLUSION] SUSPECTS'

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ABSTRACT

A pertinent challenge in ensuring digital gender equality lies in the fact that, to date, comprehensive information and knowledge of a gender-based perspective of ICT (information and communication technology) use is limited (Deen-swarrray, Gillwald, & Morrell, 2013).

Quantitative information undoubtedly plays a pivotal role in the advancement of digital inclusion of South African citizens by providing a surface view of the digital landscape. Such statistical data is typically useful in examining access to ICT and identifying factors related to usage. However, the qualitative approach allows for deeper reflection and understanding of the issues to be gained. This approach is particularly useful in bringing to the fore the nuances of ICT activity of specific groupings, in this case, marginalised women (Buskens & Webb, 2014). This on-going research study investigates 'the usual suspects' in discussions surrounding digital inclusion of women – i.e. access and skills – but allows for exploration into the less commonly considered, more elusive and perhaps less expected issues in the ICT usage patterns of women in marginalised communities. This includes their perspectives of ICT, the nature of their digital adoption approaches, the potential impact of traditional societal gender norms in the digital space and 'mental models' of gender and ICT.

In-depth interviews with women in three marginalised Western Cape communities are currently in progress. Findings have so far allowed for reflection into such complex, multifaceted issues typically underlying the available statistical data.

A greater understanding of such underlying issues may be instrumental in implementing digital inclusion strategies and interventions which specifically target women in marginalised communities.

Keywords: Women, Marginalised communities, ICT, Qualitative research

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BIOGRAPHY



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DEFINING MEDIA LITERACY WITHIN A COMMUNITY CONTEXT

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ABSTRACT

Aim/Purpose	Media literacy has been identified as one of the learning pathways of e-literacy (or digital literacy). There exists general consensus among academics and policymakers that media literacy is <i>“the ability to access, analyse, and evaluate media in multiple forms and communicate competently within these forms”</i> (Bulger, 2012). This definition however poses challenges when the focus is narrowed down to a community context, where many community members are still not e-literate and therefore have challenges with scrutinising the content of media messages for bias, accuracy and purpose. The aim of this paper is to propose a clear and concise definition of media literacy within a community context, specifically for the South African community, which includes disadvantaged and rural communities.
Background	BusinessDictionary (2017) defines media as <i>“communication channels through which news, entertainment, education, data, or promotional messages are disseminated. Media includes every broadcasting and narrowcasting media such as newspapers, magazines, TV, radio, billboards, direct mail, telephone, fax, and internet”</i>. Wikipedia (2017) encapsulates media as <i>“the collective communication outlets or tools used to store and deliver information or data”</i>. Media are not always reliable or accurate, and can be biased in various ways. The term for news published under the guise of being authentic, but is in fact a deliberate attempt to mislead people, is called “fake news”. The Collins English Dictionary (2017) defines fake news as <i>“false, often sensational, information disseminated under the guise of news reporting”</i>. Fake news is also viewed as <i>“false stories that appear to be news, spread on the internet or using other media, usually created to influence political views or as a joke”</i> (Cambridge Dictionary, 2017). Media literacy points to a set of skills, with the focus on e-skills, required by people to discern fake news and to make us more efficient and well-informed about the world around us. However, according to various researchers, media literacy has to date not been a high priority for governments in many developing countries. Furthermore, existing definitions of media literacy are too vague to successfully encapsulate a community context that includes disadvantaged communities and extreme rural areas where technology and connectivity are limited or completely non-existent.
Methodology	A comprehensive literature review was adopted to present an overview of media literacy within a community context. Literature on media

literacy in both developed and developing countries was reviewed and conceptualised to propose a clear, concise definition of media literacy within a community context, which includes disadvantaged and rural communities in South Africa.

Contribution	This paper proposes a definition of media literacy within a community context in South Africa that can serve as a springboard to developing media literacy training programmes for the community and a media literacy framework that is aligned with National Electronic Media Institute of South Africa's (NEMISA's) conceptualisation of the South African National e-Skills Development Plan (DoC, 2010).
Findings	1. With the global economy becoming increasingly reliant on emerging Information and Communications Technologies (ICTs), e-skilled workers have become essential for the competitiveness of local economies and the self-reliance of societies (DoC, 2010). 2. For an individual to be considered e-skilled, the person should <i>inter alia</i> be e-literate. Media literacy is viewed as a learning pathway towards e-literacy. 3. Communication through media, electronically and via print, can be intrusive, unethical, unprofessional, tasteless, and factually wrong (White 2013). 4. Media are often used to drive political agendas. In most developing countries, the state owns a large portion of the media, including radio, television and newspapers. 5. The International Research and Exchange Board (IREX) provides in-depth analyses of the conditions for independent media in 80 countries across the world and ranks countries according to a Media Sustainability Index (MSI). According to the IREX MSI, the literacy levels of most developing countries are ranked below the sustainability benchmark. 6. Although South Africa's MSI score is below the sustainability benchmark, our country is ranked the highest among all of the African, Middle Eastern, and Western Eurasian countries (including Russia). 7. Developed countries place a higher priority on media literacy than developing countries and have many media literacy training programmes in place that are implemented throughout the world, including in developing countries. 8. Most media literacy definitions available in literature are founded on the Aspen Institute's (1993, cited by CML, n.d.) basic definition of this term, namely, "<i>the ability to access, analyse, evaluate and create media in a variety of forms</i>". 9. There is limited scientific information available on media literacy within a community context, and when found, this information lacks a clear and concise definition of media literacy that can be adopted as a springboard to developing relevant training programmes for implementation in rural and disadvantaged communities of developing countries.
Recommendations for Practitioners	Participatory action is a strong theme found in media literacy literature (Boulton, 2016). Practitioners of media literacy should therefore be informed, reflective and engaged citizens that participate effectively in democratic societies and contribute towards policy making. Media literacy trainers should cultivate citizens who have the ability to discern

	fake news from objective and true representations of an event or situation.
Recommendation for Researchers	When conducting research on media literacy and relevant training programmes, demographics are an important aspect to consider. While ICTs and connectivity are readily available in urban communities – something many rural communities are not (yet) privy to – these urban communities are also more exposed to fake news. The opposite is also true. While some rural communities might be less exposed to fake news, these community members have less opportunities to become media literate in order to discern fake news, as their access to media (electronically and via print) is limited. Implementation of e-literacy and media literacy training in rural areas is also more challenging due to non-connectivity and limited or non-availability of requisite technologies.
Impact on Society	The definition of media literacy within a community concept in South Africa could be applicable to and adopted by other developing countries, especially within the SADC region, which could further lead to these countries implementing (with little or no change) media literacy training programmes developed by NEMISA through the relevant CoLabs.
Future Research	The next step should be to establish a baseline against which the media literacy levels of the community in South Africa can be measured. Based on the media literacy levels of the community, which will most probably vary from urban, peri-urban to rural areas, media literacy training programmes need to be developed and implemented across the entire country.
Keywords	Media literacy, e-literacy, fake news, e-skills, community, developing countries

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BIOGRAPHY



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ANTOINETTE LOMBARD is the Director of the Southern Gauteng and Northern Cape CoLab, hosted by the Vaal University of Technology in collaboration with the National Electronic Media Institute of South Africa (NEMISA). Her focus is on rolling out relevant training programmes in e-literacy to the South African community, which includes disadvantaged and extreme rural communities. She currently concentrates on addressing the limited broadband and internet access challenges that face the community in the Northern Cape Province of South Africa in order to roll out efficient e-literacy training programmes. Antoinette has more than 20 years' experience in higher education, having progressed from Lecturer to Head of the ICT Department to Director. She has successfully graduated Master's students in Information Technology and has experience in

managing research projects. She holds a BTech degree in Financial Information Technology and a Masters of Technology degree in Information Technology.

PLATFORM DESIGN, HIGHER EDUCATION AND THE LUDDITE CONTRADICTION: AN EXPLORATORY CASE STUDY OF MACHINE BREAKING DURING #FEESMUSTFALL

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ABSTRACT

The arena in which higher education institutions engage with students is increasingly becoming digitally mediated. This digital arena is also home to emerging socio-technical digital platforms, which have become a growing channel of engagement in higher education. The underlying principles of continuous innovation in higher education have been challenged in the last three decades by the ever-growing role and power of the end-user. The recent observance of incidents of Luddist machine breaking during the #FeesMustFall protests in South Africa may be indicative of a growing disconnect, especially as it pertains to engagement with and innovation through digital technologies. The ability of higher education institutions to listen much more effectively to student voices, which are increasingly being voiced through digital means, has been starkly called into question by the #FeesMustFall protesters. In this exploratory case study, we examine similarities between 18th century British Luddism and digital technology focused machine breaking incidents that occurred during the #FeesMustFall protests. Herein, an argue is presented that the parallel mechanisms and tensions that were at work in the past during the Industrial Revolution and is also prevalent in the current Digital Revolution may strengthen the case for user innovation as a basis of continuous innovation within the Higher Education context in South Africa.

BIOGRAPHY



MR WOUTER GROVE is an experienced management consultant with a passion for leveraging the positive impacts of technology. His research focuses on Digital Social Innovation; Games in Civic Engagement; Experiential Learning, Internet & eCommerce and Information System Delivery. Wouter is a Project Manager at the Western Cape CoLab for e-Inclusion & Social Innovation. He is also pursuing a joint PhD degree between the University of the Western Cape (UWC) and the Vrije Universiteit Brussel (VUB). His PhD research is focused on the role of Living Labs in

designing emerging digital platforms within the South African context. Mr Grove graduated *cum laude* (M.Com – Information Management) from UWC.

IMPACTS OF E-MARKETING ON TOURIST ARRIVALS AT NATURE AND WILDLIFE RESERVES OF THE NORTH-WEST PROVINCE, SOUTH AFRICA

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ABSTRACT

The purpose of this study is to investigate the impact of e-Marketing on tourist arrivals in the nature and wildlife reserves of the North-West Province. Information communication technologies (ICTs) have revolutionized the travel industry in the last decade. e-Marketing is a layer of digital media that allows users to self-select their own experiences and affords marketers to bridge media, gain feedback, reiterate their message and build relationships. Due to an increase in nature-based tourism, the South African National parks (SANParks), have experienced an increase in the number of visitors to the national parks. To ensure a maintenance in the increase of the number of visitors, modern e-Marketing practices have to be implemented. This study is an empirical, descriptive investigation, which applies a mixed methodology approach. This approach uses both qualitative and quantitative data collection methods and analysis, namely interviews and questionnaire surveys. The sample consisted of 15 North West Province tourism stakeholders who attended a tourism steering committee meeting. Additionally, convenience sampling was used to select 40 tourists visiting the Pilanesberg National Park.

The results show that the province relies on traditional promotional techniques to attract tourists. Seventy percent of the province's tourism stakeholders attest to using company magazines, posters, flyers, travel expos and word-of-mouth to communicate with potential tourists. Only about 30% of the stakeholder respondents admitted to using e-Marketing techniques such as Facebook, Twitter, YouTube and external booking websites such as booking.com and TripAdvisor.com. This is in contradiction with 68% of the tourists who admitted browsing websites such as Booking.com when planning a holiday. Although results of the study have interestingly revealed that most tourism organizations have websites, these websites are however not updated on a regular basis. Sixty-seven percent of North West Province's tourism stakeholders have indicated that they update their websites monthly.

Furthermore, results of this study seem to indicate that e-marketing is not widely used in the nature and wildlife reserves of the North West Province. Instead, marketers rely predominantly on traditional promotional campaigns while tourists rely on e-Marketing for selecting their destination of choice. It is the view of the researchers that entities such as the North West Parks Board (NWPB) and SANParks must prioritize human resource training in matters relating to e-Marketing. In addition, these organizations should also consider hiring a competent staff who will focus on daily activities related to e-Marketing.

Keywords: E-marketing; Tourist arrivals, Nature and Wildlife reserves, websites.

DIGITAL ADVANCEMENTS IN THE PROMOTION OF DOMESTIC TOURISM

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ABSTRACT

The South African Tourism (SAT), through its marketing campaign “Shot Left,” was introduced with the aim of promoting domestic tourism. The incorporation of the campaign into digital technology is still lacking, especially in the rural areas of South Africa. During the launch of the North West Provincial House of Traditional Leaders, which took place at Tshidilamolomo Village, a questionnaire-based survey was conducted to assess the role of digital technology in the South African rural domestic tourism sector. Respondents were randomly selected and out of a total 150 questionnaires that were distributed 84 were completed.

Participant theory was adopted for this study. In addition, Statistical Package for Social Science (SPSS) was used for the analysis of data and generation of frequencies. The results indicated low usage of technology in the promotion of domestic tourism and lack of information regarding the use of the internet in particular. A total of 51% of the respondents reported not learning about the launch through social media. Instead, a number of the respondents (27%) got to know about the launch through radio followed by word-of-mouth and the Kgosi (Local Chief, (15%). A further 13% and 12% of the respondents learnt about the launch through the Culture, Arts and Traditional Affairs Department (CATA) as well as the Tribal Office, respectively.

Similarly, most rural communities in South Africa are still using traditional ways of announcing local events, festivals, launches and gatherings. Such communication approaches are typically limited to a specific local audience and therefore place limitation domestic tourists from other regions to participate in these activities. South African communities generally experience poor access to the internet. In addition, the costs of data in South Africa is expensive in comparison to other Southern African Development Community (SADC) countries. Results emanating from this study suggest that in order for rural communities to meaningfully participate in domestic tourism, the establishment of innovation hubs and WiFi hotspots at community centres such as clinics and schools should be encouraged.

Keywords: Digital, domestic tourism, rural communities, participate

BIBLIOGRAPHY



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at North-West University.

INTERVENTIONS FOR IMPROVING MANAGEMENT OF CHRONIC NON-COMMUNICABLE DISEASES IN DIKGALE, A RURAL AREA IN LIMPOPO PROVINCE, SOUTH AFRICA

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ABSTRACT

Aim/Purpose	The aim of this study was to develop interventions for improving the management of chronic diseases in the form of an integrated, evidence-based chronic disease management model in Dikgale, a rural area of Limpopo Province in South Africa.
Background	Chronic disease management (CDM) is an approach to health care that maintains the quality of people's health through the prevention, early detection and management of chronic diseases.
Methodology	A multifaceted intervention system, called 'quality circles' (QCs), was developed to improve the quality and the management of chronic diseases in the Dikgale Health and Demographic Surveillance System (HDSS). The QCs employed the findings from previous studies, which formed part of the larger project in the study area of Dikgale. The larger project was a quantitative study involved the use of a STEPwise survey as well as qualitative studies based on focus group discussions and semi-structured interviews.
Contribution	Previous studies in Dikgale HDSS revealed the occurrence of an epidemiological transition. In previous studies, the most widely reported barriers in Dikgale were: (i) lack of knowledge of non-communicable diseases (NCDs); and (ii) shortages of medication and nurses in clinics, which results in patients having to wait for a long time before accessing medical treatment. Lack of training of health care providers on the management of chronic diseases and lack of supervision by the district and provincial health managers, coupled with poor dissemination of guidelines were found to be the main contributing factors towards lack of knowledge of NCD management among nurses and community health care workers (CHWs).
Findings	Consideration of all of these findings led to the development of a model which focuses on integrating nursing services, CHWs and traditional health practitioners (THPs), including a well-established clinical information system for health care providers. A novel aspect of the model is the inclusion of community ambassadors who are on treatment for NCDs and are, thus, repositories of knowledge who can serve as a bridge between health care workers and community members. Therefore, it can be concluded that there is a need to improve the control of NCD through health system strengthening.

Recommendations for Practitioners	During the implementation of the model we have developed, emphasis should also be placed on the complex and dynamic settings in which the delivery of nursing care occurs. To this end, social, political, economic and clinical factors should also be taken into consideration. Such an approach will allow the strengthening of the health system for monitoring and tracking progress of the patients with NCD through the development of a computer based system for monitoring of NCD patients at facility level. Lastly, the use of mobile technology to enhance adherence to treatment and follow-up of patients should be explored.
Recommendation for Researchers	Conduct further research on planned community intervention programmes, which are an essential component of the strategy for prevention of NCDs. This includes the use of mobile telephones to receive automated text messages to improve adherence and management of chronic illnesses.
Impact on Society	The public health implications from the study are that our interventions are oriented towards health promotion and prevention through a primary health care approach in order to effectively respond to the complex social, cultural and behavioural issues associated with NCDs using mobile technology.
Future Research	The following two gaps would need to be addressed in order to achieve proper control of chronic diseases: (i) the gap between effective interventions in research studies and what clinicians do in practice; and (ii) the gap between what clinicians in their offices recommend to patients and what patients do at home and in their communities. The use of mobile telephones should be investigated to support patient self-management as well as monitoring of adherence to treatment by clinicians.
Keywords	Health System Strengthening, Information Technology, Health Planning, Interdisciplinary Communication, Managed Care Programs, Primary Prevention.

BIOGRAPHY



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THE USE OF SOCIAL MEDIA TOURISM POLICY FRAMEWORK

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ABSTRACT

The fourth industrial revolution has taken over the information communication technology (ICT) with its competitiveness in the knowledge economy. ICT plays an important role in the tourism industry - one of the national priority areas and an important pillar of the strategy of the North West Provincial (NWP) government. The current study is aimed at assessing the use of social media in the tourism industry. Purposive sampling was used from NWP government's four local districts, namely: Ngaka Modiri Molema, Dr Ruth Mompoti, Dr Kenneth Kaunda and Bojanala. Youth representatives from these districts who attended e-Literacy Training were surveyed through a questionnaire instrument. A total of 100 questionnaires were distributed and 85 were completed, representing a satisfactory response rate of 85%. A stakeholder theory approach was adopted for the study and Statistical Package for Social Sciences (SPSS) was used to get T-tests and frequencies.

An overwhelming, 100% of the respondents were of the view that the use of social media in tourism policy dissemination should be encouraged. Most of the respondents used Facebook (40%) followed by WhatsApp (13%) to respond to the survey. A total of 60% of the respondents encouraged the use of the Facebook platform for future dissemination of tourism policies and information. The majority of the youth surveyed were found to be not knowledgeable on tourism policies.

The study confirms that the youth are active users of social media platforms; mainly for dissemination, educational, social, technical and economic activities. Therefore, it can be concluded that the inclusion of social media in the promotion of a relevant tourism policy frameworks will encourage the participation of more youth and possibly other tourism stakeholders. The researchers identified the following implications: (i) an awareness of social media platforms should be strengthened and taken to all districts; (ii) there should be an inclusivity of all tourism stakeholders in the tourism policy planning processes; and (iii) there should be a shift from traditional awareness campaigns to the use of social media platforms.

Keywords: Social media, tourism policy frameworks, youth

BIOGRAPHY



PROF HARETSEBE MANWA is the Deputy Director of the School of Tourism at the North-West University, Mahikeng Campus. Prof Manwa has extensive experience in lecturing at universities in South Africa, Zimbabwe and Botswana as well as networking with local communities and DMOs. Her areas of expertise include community-based tourism in Southern Africa, cultural tourism, sustainable tourism and tourism planning, gender and tourism and marketing and tourist behaviour. Prof Manwa's PhD in Tourism Management was obtained at the James Cook University, Australia. Her other qualifications include a Master of Education and Master of Public Administration degree, which were obtained from the Universities of Manchester and Zimbabwe, respectively.

DIGITAL ADVANCEMENTS IN THE PROMOTION OF DOMESTIC TOURISM

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ABSTRACT

Aim/Purpose

The South African Tourism (SAT), through its marketing campaign “Shot Left,” was introduced to promote domestic tourism. The incorporation of digital technology in such a campaign is still lacking especially in the rural areas of South Africa. During the North West Provincial House of Traditional Leaders’ launch, which took place at Ngaka Modiri Molema, in Tshidilamolomo Village, a survey in the form of a questionnaire was conducted to assess the role of digital technology in the South African rural domestic tourism. Respondents were randomly selected and a total of 150 questionnaires were distributed, and 84 were completed. Participant theory was adopted for the current study. In addition, Statistical Package for Social Science (SPSS) was used for analysis and to generate frequencies. The results indicate a low usage of technology in the promotion of domestic tourism and lack of information regarding the use, in particular, of the internet. A total of 67% reported that the information about the event was disseminated through local traditional leaders; 21% mentioned radio and this was followed by Facebook (6%), and Whatsapp (4%). Most rural communities in South Africa are still using the traditional ways to announce local events, festivals, launches and gatherings. Such approaches limit other domestic tourists from other regions to participate. Generally, the South African communities are still experiencing poor access to the internet. In addition to this, the cost of data is also high in South Africa in comparison to other Southern African Development Community (SADC) countries. The implications of this study is that in order for rural communities to meaningfully participate in domestic tourism, an establishment of innovation hubs and Wi-Fi hotspots at community centres such as clinics and schools should be encouraged.

Background

South Africa is the main recipient (over 60%) of international arrivals in Africa due to its commitment to ICT development (Kiprutto et al., 2011; Ntshona, 2018). While the country is performing well in attracting international tourists, domestic tourism is performing at a minimal level (Ntshona, 2018). According to the Domestic Tourism Growth Strategy 2012-2020 (2012), a lack of participation in domestic tourism among the South Africans, especially previously disadvantaged communities, is due to many reasons ranging from limited marketing and information provision to the entire South African population. The strategy indicates a need for a direct domestic consumer engagement information provision. The South African Tourism (SAT), through its marketing campaign “Shot Left,” was introduced to promote domestic tourism. The incorporation of such a campaign in digital technology is still lacking, especially in the rural areas of South Africa. The emphasis on the importance of

information dissemination in the tourism industry cannot be ignored. Hence, in 2009 the National Department of Tourism established an annual National Tourism Careers Expo (NTCE) to bridge the information gap between learners and various tourism stakeholders. This and the next two years the expo will be hosted in the North Province and this year's theme is tourism and digital transformation (Mohlanke, 2018).

Currently, the most visited provinces in the country are Limpopo (37%), KwaZulu Natal (18%) and Gauteng (14%) (Tourism Quarterly Factsheet, 2017). The Tourism-North West Provincial Government (2018), highlights insufficient budget for destination marketing organisation (DMO) such as North West Tourism Board as a challenge in destination marketing; hence the need to encourage digital advancement in the tourism industry. Digital transformation is not only the cheaper method of marketing tourism products, but it is also more easily accessible and has a much faster delivery time. According to Bethapudi (2013), although social media such as Twitter, Facebook and blogs have increased the level of information sharing among consumers, most of the tourism businesses are still utilizing old traditional marketing tools. A study commissioned by the European Commission (2017) suggests that tourism companies should not only use social media for feedback and online competition only, since this does not promote a long term product awareness and customer loyalty. Instead, tourism businesses should consider embracing marketing strategies such as 'braggie', a marketing strategy involving tourists taking photos and uploading them to brag on social media.

Although information communication technology (ICT) is becoming popular, countries such as Kenya still lack internet connectivity (Kiprutto, Kigio, Riungu, 2011), which then limits participation of individuals in tourism activities. South Africa also has its own fair of challenges relating to internet access, more especially in the rural areas of the country. According to Community Survey (2016), the majority of households in the North West Province (111 7313) have generally no access to the internet compared to those with access to the internet (99 908). Out of the five districts in the Province, Ngaka Modiri Molema has the third highest number of households with access to the internet (17 344). At 47 959, the Bojale District has the highest internet access, and it is followed by Dr Kenneth Kaunda and Dr Ruth Segomotsi Mompati Districts, with a respective 27 655 and 6 950 households having internet access (Community Survey, 2016). The total number of households without internet service in the Ngaka Modiri Molema District is 246 943. In this same district, most male-headed households (144 341) do not have access to the internet service in comparison to female-headed households (102 602). This is, however, different at provincial level, where more male-headed households have access to the internet service compared to their female counterparts.

Methodology

During the launch of the North West Provincial House of Traditional Leaders, which took place at Tshidilamolomo Village, a survey in the form of a questionnaire was conducted to assess the role of digital technology in the South African rural domestic tourism market. Respondents were randomly selected and a total of 150 questionnaires were distributed, and 84 were completed. The respondents were surveyed based on their willingness and expression of interest towards participation in the study. Semi-structured questionnaires were distributed to respondents by five fieldworkers including the principal researcher. Participant theory was adopted for the current study. In addition, Statistical Package for Social

Science (SPSS) version 25 was used to capture data and analyse the results as encouraged by Botma et al. (2010).

Contribution	Digital advancement plays a major role in the promotion of domestic tourism. An introduction of such digital advancements in the rural areas of South Africa can increase participation of locals in various events that are taking place in the neighbouring villages, towns, cities and across the various provinces of the country.
Findings	Findings emanating from respondents attending the launch of the North West Provincial House of Traditional Leaders are as follows: 1. The split in terms gender participation of the respondents was: 38% male and 62% female. 2. Highest level of education of respondents: 56.3% completed secondary high school. 3. The highest monthly income range of respondents: R100-R1000 (34%). 4. The results indicate low usage of technology in the promotion of domestic tourism and lack of information regarding the use of the internet in particular. 5. A total of 51% of respondents reported that they did not learn about the launch through social media. Instead, most of the respondents (67%) mentioned Kgosi (local chiefs) as their source of information. 6. About 21% of the respondents heard about the event on radio. 7. Very few respondents were made aware of the event via Facebook (6%), Whatsapp (4%) and other Public Platforms (1%).
Recommendations for Researchers	One of the pillars underpinning the South African domestic tourism market involves the promotion and the packaging of various cultural, sports and music events as well as lifestyle festivals. The success of these packages depend on how the requisite information is disseminated to the local population. Facebook, social media and twitter can play a major role in assisting in the marketing of an event to a larger geographical area within a short time.
Impact on Society	Most rural communities in South Africa are still using the traditional ways to market local events, festivals, launches and social gatherings. Such approaches often limit the participation of domestic tourists from other regions outside these areas. Generally, South African communities still experience poor access to the internet. In addition, the cost of data is also high in South Africa in comparison to other Southern African Development Community (SADC) countries.
Future Research	It is important to assess the role of local government in the promotion of domestic tourism and how Local Economic Development (LED) in particular participate in the digital advancements of rural communities.
Recommendations for Practitioners	In order for rural communities to meaningfully participate in domestic tourism, an establishment of innovation hubs and Wi-Fi hotspots at community centres such as clinics and schools should be encouraged.
Keywords	Digital, domestic tourism, rural communities, participate

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