# FACTORS INFLUENCING TEACHERS' ADOPTION AND INTEGRATION OF ICT INTO TEACHING IN URBAN HIGH SCHOOLS

WILIKHA MWENENI SHATONA



SULTAN IDRIS EDUCATION UNIVERSITY

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# ABSTRACT

The purpose of the study was to identify the factors that influence teachers' adoption and integration of ICT into teaching in urban high schools, of which the case study primarily used schools in Windhoek Namibia, to determine how knowledgeable teachers are with the utilization of ICT and how effective ICT is within the education sector. There are a lot of studies in the area, but what made this study unique and of essence is that the empirical research has been conducted to examine this phenomenon from the teachers perceptive in Namibia. The research method used in the collection of data for the thesis study was quantitative in nature. Primary data was collected using closed-ended structured questionnaires from 169 Teachers and an assessment checklist. Furthermore, data obtained from the study were analysed using the Statistical Package for Social Sciences software version 16. The findings of the study through the employment of the Spearman Correlation tests illuminate that ICT integration is positively related to teacher's attitude, perception and skills and or competencies. Moreover, the two probity models found the determinants of ICT integration in schools to significantly depend on gender. Teacher's ICT skills as well as Teachers' attitude, age, perception and teaching experience of the Teachers show a negative effect on ICT adoption. However, these factors are all not statistically significant. The study also provides a presentation and discussion of findings on the assessments that were conducted in eight schools. Recommendations were drawn, for instance, the need for education institution to have technical staff that assists teachers to deliver learning material using ICT.

# PELAKSANAAN DAN PENGINTEGRASIAN ICT DALAM PENGAJARAN GURU DI SEKOLAH MENENGAH KAWASAN BANDAR

## ABSTRAK

Tujuan kajian ini adalah untuk mengenal pasti faktor-faktor yang mempengaruhi penggunaan dan pengintegrasian ICT oleh Guru dalam pengajaran di sekolah menengah bandar, di mana kajian kes ini menggunakan sekolah di Windhoek Namibia. Terdapat banyak penyelidikan dalam bidang pengajian ini, tetapi yang membuat kajian ini unik dan penting adalah bahawa kajian empirikal ini telah dijalankan untuk mengkaji fenomena ini dari persepsi Guru di Namibia. Kaedah kajian yang digunakan dalam pengumpulan data untuk kajian tesis ini bersifat kuantitatif. Data primer dikumpul dengan menggunakan Soal Selidik berstruktur tertutup dari 169 Guru dan senarai semak penilaian. Selanjutnya, data yang diperoleh dari kajian dianalisis menggunakan Statistical Package for Social Sciences yang dikenali sebagai perisian. Dapatan kajian melalui penggunaan ujian Spearman Correlation menunjukkan bahawa integrasi ICT berkait secara positif dengan sikap, persepsi dan kemahiran dan/atau kecekapan Guru. Lebih-lebih lagi, dua model probit mendapati bahawa penentu integrasi ICT di sekolah sangat bergantung pada jantina. Kemahiran ICT Guru serta sikap, usia, persepsi dan pengalaman mengajar Guru menunjukkan kesan negatif terhadap penggunaan ICT. Walau bagaimanapun, semua faktor ini tidak signifikan secara statistik. Kajian ini juga memberikan pembentangan dan perbincangan dapatan kajian mengenai penilaian yang dilakukan di lapan buah sekolah. Cadangan dibuat, misalnya, institusi pendidikan perlu memiliki staf teknikal yang membantu guru menyampaikan bahan pembelajaran menggunakan ICT.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| AfDB | African Development Bank |
| CATT | Computer-Assisted Teacher Trainer Activity |
| CECS | Computer Education Community Service |
| ECA | Economic Commission for Africa |
| GeSCI | Global e-School Initiative |
| ICT | Information and Communications Technology |
| IDRC | International Development Research Council |
| MOE | Ministry of Education |
| NAMCOL | Namibian College of Open Learning |
| NET | Namibian Education Technology |
| NETA | Namibia Education Training Academy |
| NICI | National Information and Communication Infrastructures |
| NPST | National Professional Standards for Teachers in Namibia |
| NSSCO | Namibia Senior Secondary Certificate Ordinary |
| SDG | Sustainable Development Goals |
| SPSS | Statistical Package for Social Sciences |
| UNDP | United Nations Development Programme |
| UNECA | United Nations Economic Commission for Africa |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| USAID | United States Agency for International Development |

# APPENDIX LIST

A Questionnaire

B Assessment Checklist

# CHAPTER 1

# INTRODUCTION



## 1.1 Background

The growth in the use of ICTs in all industries led to the improvement in global productivity (Wambui & Black, 2012). Countries across the globe began to embrace the use of ICT in their various endeavours. A key sector that has been earmarked for adoption and integration of technology is the education sector (Kilhoza et al., 2016). In sub-Saharan Africa, ICT integration is variegated from one region to another with countries such as South Africa, Namibia, Mauritius, Rwanda and Kenya with Namibia leading in ICT integration in the region (UNESCO, 2016). Namibia's population is 2.1 million (National Census, 2011).

The education sector in Namibia is a huge one, there are about 685 806 school goers, 38 000 teachers and the government spends on average N$6.8 billion (US$ 680 million) on teachers' salaries annually (National Education Public Expenditure report, 2017).

The implementation of ICT education policy in Namibia in 1996 considerably expanded the use of ICT in the education sector (Chainda, 2011). However, at the same time the implementation of the policy requirements has not been uniform from one place to another in Namibia (Ngololo, 2010; Simon & Ngololo, 2015) notes that the integration of ICT has been slow in other instances. As a result of various hurdles, some policy and institutional manoeuvres were made. For instance, in the year 2005, the Namibia ICT Policy was put in place. Subsequently, the National Professional Standards for Teachers in Namibia (NPST) and ICT Standards for Educators (ICT) were set up (Chainda, 2011). These were set up to ensure successful ICT incorporation into the education sector (Ministry of Education, 2007). Under the Namibian ICT policy (2005), all staff are expected to receive ICT training in their classrooms and take full advantage of their pedagogical applications.

This, therefore, underscores how crucial the integration of ICT is to the development of the nation. Other scholars such as Ngololo (2010) noted that the underlying motive of the Namibian state is to produce ICT literate citizens that can use computers and other technologies in their daily lives. The use of ICT in activities and processes such as curriculum, content, educational management, training and usage, monitoring and

evaluation, and infrastructure Ngololo (2010). Therefore, the integration of ICT in Namibia is placed at the centre of education. In addition, the Namibia ICT Policy states that the aim of incorporating ICT into education is to supplement and improve traditional educational institutions, education delivery systems, and instructional material and not to substitute teachers. As such teachers become indispensable actors in the integration of ICT in Namibia's education system. This similar position is also demonstrated in the words of the minister of education who reiterated, "All professions require ICT skills". Not only professions but life in general demands knowledge of ICT" (Smith, 2017). Burns (2006) state that in this vein, ICT skills are noted as "21st-century skills". Similarly, Hashim (2017, p. 2) contends that ICT skills enhance learners' lives both at home and in schools.



Given this background, there is a pertinent need to explore the integration of ICT in Namibian high schools, understanding the integration of ICT in urban high schools will enable us to explore factors that influence the integration of ICT and ways of overcoming some hurdles that are faced in the integration of ICT in Namibia's education. As Mutenga, (2006), Ngololo, (2010), Simon & Ngololo, 2015) Kihoza et al, (2016) argued, teachers play a key role in ICT integration. According to Peeraer and Van Petegem (2011), the factors that influence ICT Integration can be grouped into intrinsic and extrinsic. Intrinsic are the factors that are less controllable such as age, gender and learners' background (Capuk, 2014; Flores, Santero and Gordillo, 2017; Hashim, 2017; Prensky (cited in Peeraer & Van Petegem, 2011).

On the other hand, extrinsic factors are factors that controllable and include school support, teacher's perception, training and computer competences (Tondeur et al, 2016; Razak et al, 2018; Isleem, 2003; Honey & Moeller, 1990). Hence, this study focused on factors that influence Teachers' integration of ICT, exploring the role played by Teachers' skills, competencies and perception in ICT integration. This then enables us to enhance our understanding of how to overcome the barriers to successful ICT integration.

## 1.2 Problem Statement

The Namibian Minister of Education acknowledged that there are serious concerns about the low integration of information and common technologies (ICT) in Namibian schools and numerous committed efforts were underway to change the situation (Smith, 2017). It is stated by the Namibian government that there have been numerous efforts to promote the integration of ICT.

However, the results are not at par with the government's efforts. Moreover, most schools have computers and access to the Internet, but most Administrators, Teachers and Learners only use computers for mathematics and science but in other subjects, they hardly make use of them. The government of Namibia through the National ICT Policy (2005) emphasizes building knowledge-based society 13 years after the policy was pronouncement, ICT integration in Namibia still lags behind the set target (Smith, 2017).

In a study on national ICT policy integration in Namibia provide that there is a digital gap between the developed and the developing world in terms of ICT integration (Isaacs, Kazembe & Kazondovi, 2018). In a study on ICT integration in the Katima Mulilo region in Namibia Simataa (2015) reported that there are challenges to ICT integration in education in Namibia.

Furthermore, the study noted that the challenges include people lacking computer qualifications and adequate computer experience. When people do not have the necessary computer qualifications and experiences then they are likely to result in lower ICT adoption. This is the basis for choosing maths and science teachers because they use much of ICT. Similarly, Simataa and Simasiku (2012) pointed, "The Namibian Educational sector acknowledges the impact that technology bears in education, however, ICTs have not been thoroughly immersed in classroom practice".

Besides, teachers have the varying perception of ICT integration (Simataa and Simasiku, 2012). In situations where teachers' perception towards ICT is positive, there are greater chances for ICT integration (Huang, 2003, cited in Albirini, 2006; (Kihoza et al, 2016; Tondeur, Van Braak and Valcke, 2007; Tondeur et al, 2016). Conversely, it is also noted that despite significant investments by the government in ICT integration some teachers' perception remains low in other regions (Simon and Ngololo, 2015; Smith, 2017). However, it is important to know that this is not a problem for Namibia only, the study conducted by Pelgrum (2001), checked that, evidently, most countries have not yet

managed to build appropriate facilities to keep teachers up-to - date with emerging technologies to incorporate these into teaching.

In terms of literature, a few research works have been done on the topic we are researching here. Hence, the researcher takes this opportunity to add to the literature in the context of Namibia. According to researchers such as Becta (2014), are of the view that sometimes the problem is not the various barriers that exists in a specific subject area but rather with those that are tasked with the responsibility of teaching. To this end, this study seeks to explore and examine the factors that influence ICT integration, for example, the role of teachers' skills, competencies and perception in ICT integration in teaching and learning in urban high schools in Windhoek that is in the Khomas region of Namibia. The researcher is of the notion that this is a key step for developing countries and Namibia to reach out to the developed world and to in terms of improvements in ICT integration.

## 1.3 The Objective of The Study

The specific objectives of the study were to:

1. Identify factors that influence the integration of ICT in Namibian urban high schools Teachers in Windhoek.
2. To determine how knowledgeable Teachers are with the utilization of ICT and how effective ICT is within the education sector.

## 1.4 Research questions

In light of the above research objectives mentioned above; in this research, the following questions were raised to be answered at the end of the study;

1. What are the factors affecting ICT integration into teaching and learning in urban high schools in Windhoek, Namibia?
2. Do Namibian Teachers know how to make use of ICT as far as education is concerned?

## 1.5 Hypothesis



This research was intended to search for empirical evidence to test the hypothesis below:

Null hypothesis (H01): ‘there is no significant correlation between teacher’s ICT skills and factors in ICT integration.

Null hypothesis (H02): ‘Namibian Teachers do not know ICT uses in education.

## 1.6 Significance of The Study

The Namibia ICT Policy 2005 indicates that it is necessary to leverage ICT to support and promote learning for all learners and teachers across the curriculum (Namibia ICT Policy,

2005). Therefore, it is pertinent that a study is done to explore the factors that influence ICT integration in urban high schools in Windhoek. Some studies have been done on ICT integration in Namibia such as (Ngololo, 2010; Simon & Ngololo, 2015; Simataa, 2015). The covered ICT integration in rural schools (Ngololo, 2010; Simon and Ngololo, 2015; and some focused on the implementation of ICT policies from a broad picture (Simataa, 2015). Similarly, some studies such as Burns (2006), indicate that obstacles that could delay or detour the development of the knowledge society exist. Interestingly, this study (Burns, 2006) did not elaborate on these obstacles, so this study envisages that part of a solution to low ICT integration includes exploring the factors that influence science and mathematics Teachers' integration of ICT in urban high schools.



Science and mathematics Teachers have been chosen as the focus of this study, for science and mathematics subjects in most cases make use of developments in technology compared to other subjects (Ghavifekr et al, 2014; Hernandez, 2017). Namibia's 2030 vision is to be one of the leading countries in ICT. To achieve this vision requires that nuanced studies be conducted to find out the factors that influence the integration of ICT in education. To this end, this study contributes to the community particularly to those who research on ICT; this was done through the exploration of factors that influence ICT integration in urban high schools and analysing of the role played by Teachers' perception and skills in ICT integration. Second, the analysis was put in some information that may be used by policymakers with officials from the ministry of education tasked to come up with better policies that enhance ICT integration.

In relation to teachers, the study contributes to an understanding of the factors that influence ICT Integration; this enabled the teachers to address some of the factors that derail ICT integration. More specifically, the study was aimed at providing teachers with knowledge on creating positive thinking towards ICT integration. Thirdly, the study was aimed at providing some feedback to practitioners, specifically the teachers.

## 1.7 Scope of the study

The researcher found it necessary to conduct her research at the secondary school level because it is a fundamental national level in terms of scholars' age to embrace technology. The study covered 169 teachers from Windhoek Urban high schools. Moreover, findings from the research will help not only the Ministry of Education but also other public and private institutions such as the Ministry of Information and Communication Technology and ICT businesses. This research is limited to space in that it is carried out in education institutions, particularly in the Ministry of Education in Namibia. The study used a sample size of 169 Teachers based in eight urban high schools Windhoek. This sample is not large enough to make broader generalizations in a country with 300 Teachers. Furthermore, the study focused on urban Teachers therefore the findings cannot fully be used to explain ICT integration in rural schools and other regions in Namibia.

## 1.8 Thesis structure

The thesis was divided into five (5) chapters. Chapter one (1) discussed the study context, as well as the problem statement. It elaborates on the research goals and the questions, which the research intends to answer. Chapter two (2) reviewed the existing literature on factors that influence ICT integration, the role of Teacher's skills, competencies and perception in ICT integration in teaching and learning in schools and provide in-depth analysis and theoretical framework of ICT Integration, and determinants. Chapter three (3) described and demonstrated the research methodology used in the report, the target population, the sampling, data collection methods and data analysis procedures. Chapter four (4) provides an outline of the generated data and an analysis of the findings of the research. The research results are derived from the primary data sources and the findings relevant to the theory used in the analysis are discussed. Chapter five (5) focused on the study's review of results, conclusions and recommendations. Finally, the segment provides potential areas for future study.

## 1.9 Operational definitions

### 1.9.1 ICT Competence

Computer competence is defined as being able to handle a wide variety of different applications for different purposes (van Braak et al., 2004). According to Berner (2003), Na (1993) and Summers (1990) as quoted in Bordbar (2010), the technical ability of teachers is indeed a significant predictor of the incorporation of ICT into teaching. Evidence indicates that a majority of teachers who reported negative or neutral attitudes towards the introduction of ICT into teaching and learning processes lacked information and skills that would enable them to make "informed decisions" (AlOteawi, 2002, p.253, as cited in Bordbar, 2010).

### 1.9.2 Integration of ICT

In relation with Boutkhil Guemide (2019), the integration of ICT deals with different technological tools and resources used to communicate, create, disseminate, store, and manage information. Computers, the internet, broadcasting technologies (Guemide, 2019b).

### 1.9.3 ICT Integration in the Education Sector

Countries that are equipped with the technology and knowledge to participate in the new electronic world are major players in its socio-cultural and economic developments (Guemide, 2019c). Technology's ability and relevance can support the teaching and or learning. ICTs can bring benefits on learner interaction and motivation (Guemide, 2019d).

### 1.9.4 ICT Skills

Nellie Varnishes (2016) is of the perspective that ICT skills has to do with the ability to use computer operating systems, to access software programmes and manage the basic functions of a computer device.

### 1.9.5 Intrinsic and Extrinsic factors

Bingimlas (2009) stated two types of barriers, for example, barriers at the teacher level (intrinsic) and barriers at the school level (extrinsic). Intrinsic factors, therefore, can be controlled or changed, and the extrinsic factors can hardly be controlled or changed in the short run. Barriers at the teacher level included: lack of confidence in the teacher, lack of teacher competence, resistance to change and negative attitude; and barriers at the school

level were lack of time, lack of effective training, lack of accessibility and lack of technical support. Both authors described extrinsic and intrinsic barriers with different titles but the factors identified were almost the same in both definitions. On the basis of these two definitions, we will have a brief review to explain how these barriers can affect the teaching process and the education system in particular as far as ICT integration is concerned.

## 1.10 Conclusion

This chapter was based at introducing the study by highlighting and emphasizing what the research study focused on by identifying the problem statement, research objectives and questions, the hypothesis and significance of the study. The chapter also looked at the scope of the study, the thesis structure, and before concluding operational definition of key terms used in the study. Firstly, the introduction of the chapter and or the thesis study provided the nature of the thesis topic by giving detailed emphasis on the topic, stating what the problem statement is and how it came about. Secondly, this chapter saw it fit to identify the main research objectives and questions even though it had to be broken down into many different questions with the intention of collecting data. Thirdly, it was also necessary to categorically state why the study was of essence, and how the entire thesis study is structured. Fourthly and lastly, the chapter through the operational definition of the study had to not only identify key terms used in the study but it also had to define them.