ADVANTAGES AND DISADVANTAGES OF eLEARNING IN PRIMARY AND SECONDARY SCHOOLS IN THE CONTEXT OF DEVELOPING COUNTRIES

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ABSTRACT

Information and Communication Technologies (ICTs) are ubiquitous nowadays, and there are many situations where they are overall perceived either as advantageous or as disadvantageous; but there are other situations where it is unknown whether they are overall advantageous or disadvantageous. For example, ICTs are perceived as advantageous for communication, but texting during driving is perceived as worse than drinking while driving. Concerning for example eLearning which is the use of ICTs in education, the fact that it has not yet eliminated the problem of poor academic performance raises the question as to whether ICTs are advantageous or not in education especially when one considers their high cost. Therefore, the aim of this study is to examine the perceptions of educators on the advantages and disadvantages of eLearning. This aim will be subdivided into three types of research objectives: (a) to select from existing literature suitable theories that can be applied to the examination of educators' perceptions on the advantages and disadvantages of eLearning; (b) to design a model of the factors affecting educators' perceptions on the advantages and disadvantages of eLearning; (c) to empirically test the above announced model; (d) to propose recommendations on how to optimize the impact of eLearning. Objectives a, b, and d were accomplished through the review of existing appropriate literature on teaching and learning, and on eLearning; but objective c was met through a survey of 65 educators of Camperdown town schools in the Pinetown district of KwaZulu-Natal province of South Africa. The outcomes of these four objectives are as follows: (a) Constructivism, Progressivism, and Self-regulated learning can be used as suitable theories applicable to the examination of educators perceptions on the advantages and disadvantages of eLearning; (b) It makes sense to hypothesize that educators perceptions on the advantages and disadvantages of eLearning are affected by their demographics and by their adherence to learning theories; (c) Empirical test conducted by this study

confirm that educators perceptions on the advantages and disadvantages of eLearning are affected by their adherence to constructivism and to progressivism; (d) It can be concluded that the impact of the use of ICTs on teaching and learning will be optimized through the deployment of constructivist and progressivist educators as champions of eLearning projects in schools.

Keywords: eLearning, ICTs, Learning theories, Teaching philosophies.

DECLARATION

I hereby declare that the research work presented in this thesis is my original work and has not been previously submitted in its entirety or in part for a degree in any other university. I also declare that this research work does not violate the right of others, as all the sources cited or quoted are indicated and acknowledged by means of a comprehensive list of references.

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Approved for final submission:

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DEDICATION

To God almighty, the all-knowing, the beginning and the ending, the greatest teacher of all.

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CHAPTER 1

INTRODUCTION

The purpose of this research is to identify the factors that affect the educators' perceptions on the advantages and disadvantages of using ICTs for teaching and learning. Therefore, it is important to commence this dissertation with an introduction of the advantages and disadvantages of Information and Communication Technologies (ICTs) in various domains where they are used. This chapter further presents the problem statement, aim, objectives, rationale, and the detailed structure of the dissertation.

1.1 Advantages and Disadvantages of ICTs

ICT, the acronym for Information and Communication Technology; "is an umbrella term" (Asabere 2012) covering technologies centred around electronic devices, and applications, be it in the form of hardware, software, or middleware, used in various spheres of life such as for communication, entertainment, education, commerce, health services, and governance. In these domains, various types of ICTs are used, ranging from video, radio, mobile phones, satellites, computers, printers, automated teller machines (ATM), oscilloscopes, cameras, body scanners, networks, the internet, and numerous types of software applications, to mention a few. ICTs are pervasive in today's society; however, there are advantages just as there are disadvantages involved in their usage. The following subsections will present these advantages and disadvantages in different sectors. In this study, the terms elearning will sometimes be used interchangeably with the term ICT as elearning implies teaching and learning with ICTs. The cost effectiveness aspect of these ICTs will be further motivated in the rationale section of this chapter.

1.1.1 Communication

The main advantages of ICTs in communication are speed and convenience. However, their main disadvantages are cost and health hazards, as shown below.

1.1.1.1 Speed and Convenience

ICTs have significantly evolved over the years to become a major channel of human communication, especially when distance is involved, unlike several years ago when it took several days or months to get feedback for traditional letters which were the only means of remote communication. Today, with ICT in the picture, communication with someone far away can happen in a matter of seconds. Nowadays, when there is need for keeping in touch with distant family and friends, communications are faster, easier and convenient through the use of different forms of ICT solutions such as phone calls, video conferencing, emails, fax, short messaging service (SMS), etc. These advantages can be used to explain why almost 20% of the people in Japan, United Kingdom (UK), and the United State (US) use ICTs for communication for more than 7 hours per day (Mieczakowski, 2011). In Africa, there were almost 20 million fixed telephone lines by the year 2000 which took a quantum leap of 650 million subscribers of mobile phone lines by the year 2012 (Yonazi *et al.*, 2012).

1.1.1.2 Cost and Health Hazards

Despite the above mentioned advantages of ICTs in communication (speed and convenience), their usage also comes with expenses which often are not cheap. It has been reported that the share of household earnings committed to mobiles services bills in developing nations is on the increase and is higher than that of developed nations, which reduces budgets for other households' necessities (Andrianaivo and Kpodar, 2011). Cost of ownership and maintenance can somehow be burdensome. Health hazards are also associated with ICTs when used for communication; e.g., Blood Brain Barrier caused by the effect of microwave radiations on the brain (Eberhardt *et al.* 2008), low quality of sperm cells in males which is related to the duration of

exposure to cell phones (Agarwal *et al.* 2008) fatigue, and headaches caused by microwave radiations from mobile phones (Huber *et al.* 2000; Luria *et al.* 2009), are some disadvantages that cannot be over looked. Distractions of mobile phones while driving results in accidents which can result in serious injuries.

1.1.2 Entertainment

In entertainment, the main advantages of ICTs are portability and mobility, but their main disadvantages are health hazards and overriding cultures.

1.1.2.1 Portability and Mobility

ICTs have made a profound impact on the entertainment world to the point where the influence of digital entertainment is almost ubiquitous. In the past, technology allowed people to be entertained only through radio and television. Nowadays, with development in ICTs, entertainment is now digitised and mobile with portable devices such as IPods, MP3 players, smart phones, tablet computers, etc. These devices connect through different channels such as Infrared, Bluetooth, Wireless Fidelity (Wi-Fi) and Broadband technologies to share files with other devices or for online download or upload through the internet, making availability for portable and mobile forms of entertainment which has become an inseparable lifestyle for many people (Tiilikainen, 2013). For example, in Nigeria, a survey of mobile phone users showed entertainment as one of the most valued usefulness of mobile phones (Gabriela, 2010). Also, entertainment was reported to be the principal driver of broadcasting use (Souter, 2009 ; Gabriela 2010) in all societies. Music, movies, sport and other forms of entertainment are the main products of broadcasting stations and this is highly valued by consumers.

1.1.2.2 Health Hazards and Overriding Cultures

The above paragraph shows that portability and mobility are the main advantages of ICTs in entertainment. However, just like communications, the use of ICTs for entertainment also poses health-related issues like obesity which has been linked to excessive use of ICT by children (Birch *et al.* 2011).

Early childhood obesity prevention policies recommend that a child should not be exposed to more than one hour per day of ICTs' usage (including digital media, video games, mobile media, and the Internet) in order to prevent obesity, but, due to the exciting nature of ICTs, more time is being spent on them by young ones. ICT use for entertainment, especially among the youth, also has been reported for being responsible for importing foreign cultures into a particular society, based on users adopting what they see as "interesting happenings" in other parts of the world which cause a negative impact on their own societal norms and cultures (Sina and Iyabo, 2014).

1.1.3 Commerce

The main advantages of ICTs in commerce are: improved productivity and quality of service, but their main disadvantages are privacy violation, fraud, and information overload.

1.1.3.1 Improved Productivity and Quality of Service

ICTs are widespread in business of all sizes due to the fact that successful organisations have recognised the positive impact of ICTs in their businesses and service delivery, thereby integrating it into their day-to-day operations which can be used to explain the pervasiveness of ICTs in this sector and its positive impact on the economy (Hempel *et al.,* 2004; Kramer *et al.,* 2007; UNCTAD, 2008; Yonazi *et al.*, 2012). ICTs have helped organisations in improving quality of service delivery, faster and convenient transactions, time efficient production lines in order to meet customers' satisfaction, as highlighted below for banking, tourism, and manufacturing, just to name a few (Ashington 2010).

In the banking sector, ICT infrastructures are playing a major role in productivity and growth. The introduction of basic ICTs, such as computers, network devices, phones and Automated Teller Machines (ATM), are crucial to operations in the banking systems giving rise to customer satisfaction, increase in quality of service, improved system of monitoring transactions, faster inter-banking operations and increase in revenue generation (Luka and

Frank, 2012). Users now have the flexibility of making different transactions with the use of their handsets (Ensor *et al.*, 2012). A total of 60 percent of account holders in many African countries operate mobile banking, 86 percent in the UK, and 36 percent in the US (Sharma *et al*, 2012).

In the Travel and Tourism Sector, both the airline industry and the hospitality industry depend a lot on ICTs for successful, efficient, accessible and customer-friendly operations. The introduction of ICTs, such as the Internet, Global Distribution Systems (GDSs) and Computer Reservation Systems (CRSs) has greatly impacted the industry's turnover, quality of service and customer satisfaction (Buhalis and Jun, 2011). Different ICTs are used in most tourism enterprises: 93% of workers in this sector use computers, 88% make use of the internet, 85% send emails, and the majority makes use of printers (Empirica, 2003). The Internet makes it easy for customers to have direct access to a wide variety of travel information and recommendations, which was previously only available at the office location of travel agencies. This "do-it-yourself" opportunity is only made available through ICTs (Stiakakis and Georgiadis, 2009).

In manufacturing, ICT plays a major role in supporting process improvement, reducing production cost, enabling the emergence of new technologies and business models in the market, and handling interoperability of different processes throughout the production. For example, Computer-aided-design (CAD) is now being used to improve the designing of different architectural designs, machine tools, vehicles, aircrafts, etc. In different studies, the introduction of different ICTs into the manufacturing process has helped improve productivity (Commission, 2004; Perminov and Egorova, 2005; UNCTAD, 2008).

1.1.3.2 Cybercrimes and Information Overload

Despite these advantages highlighted above (improved quality of service, customers' satisfaction, and advanced production processes, etc.) on the use of ICTs, the commerce sector still suffers some disadvantages such as

cybercrimes and information overload. In a research study done by Al Khasawneh (2014), online criminal activities were reported to be one of the major concerns of users on the usage of the internet for business transactions. Cybercrimes are made easy with the help of ICTs; identity theft, pyramid schemes, trade secret theft, 419 types of fraud, etc. (Wall 2010) constitute a worrisome trend in the business sector. Moreover, users are bombarded with a sea of unsolicited information in the name of "advertisement" leading to information overload for the user. In the work environment, according to a survey by Spira and Goldes (2007), of over 1000 workers, information overload is responsible for an average of 2.1 hours of time loss per worker per day, costing the US economy $588 billion per annum.

1.1.4 Governance

The main advantages of ICTs in governance are improved government service and public participation in governance, but their main disadvantage is privacy violation.

1.1.4.1 Improved Quality of Service and Public Participation

Electronic government, termed e-Government, is the ICTs platform used by governments worldwide as an effective means of serving citizens and other stakeholders in a more simplified and convenient manner. Governments of different nations deploy ICTs as an approach for building and operating various government services (Department, 2011; Government, 2011; NSW, 2012; Queensland, 2013) such as: government information dissemination, promotion of citizen participation in governance, making transactions (e.g., payment of taxes, levies and tolls, vehicle registrations, etc.), data collection and processing, societal security, fraud detection, improvement of public sector productivity and quality health service delivery with the use of computers, internets, networks, databases, expert systems, etc. ICTs are also being used in new initiatives for more effective and efficient governance (Vijaykumar, 2011). Governments world over are incorporating ICTs into the public service and administration to digitize the delivery of services and the

process of governing. e-Government depends on ICTs to automate the processes to serve delivery to the citizens, and other stakeholders majorly through the Internet (ITU, 2008).

Also in the health sector today, governments invest in different ICTs to improve service delivery to the public, such as electronic medical records (EMRs), e-prescription, and Computerised Physician Order Entry (CPOE) systems, Picture Archiving and Communication Systems (PACS), Electronic Health Record (EHR), etc. These ICTs are reported to help in healthcare service delivery since they are higher in quality, safer, more efficient, and quick in responding to patients' medical needs (OECD, 2010). With the help of ICTs, the quality of services has improved by 30.9% (Tobias 2010). In South Africa, mobile phones are used to alert and remind TB patients of their medication. In countries such as South Africa, Rwanda, Cambodia, Nicaragua, etc., multimedia communication programmes are being used to raise community awareness of HIV and AIDS. In Asian countries like India and Bangladesh, ICTs, such as satellites, are also being used to monitor epidemic outbreaks and ensure that information on preventive measures easily get to people (infoDev, 2006).

1.1.4.2 Privacy Violations

On the other hand, ICTs has also contributed to privacy violations. Many ICT gadgets such as closed circuit television, body scanners, biometric data collection systems, fingerprint, etc., have been deployed to help improve security. However, the general public has been under permanent monitoring, causing violations of their privacy (Van Lieshout *et al.,* 2013). According to Banisar (2010), privacy rights can be classified in four different contexts: Information, Bodily, Communication and Territorial privacy rights, all of which can be easily violated by the authority with ICT usage for intelligence gathering.

1.1.5 Education

The main advantages of ICTs in education are motivation, collaboration, communication, and quick access to educational resources, but their main disadvantages are cost and adoption.

1.1.5.1 Motivation, Collaboration, Communication and Access to Resources

The education sector, too, is not exempted from the impacts of ICTs, which are changing the way teaching and learning is done at different stages (Oliver, 2002) from pre-schools to higher institutions. ICTs have the prospective influence of transforming, quickening, improving, and developing learners' skills in a way that is motivating and engaging, which also encourages collaborations for better learning outcomes (Yusuf and Yusuf, 2009; Mikre, 2011). Various kinds of ICT products are now employed in classrooms, such as teleconferencing, audio conferencing, television lessons, audio cassettes, projectors, tablets, desktop computer, mobile phones, website, email, etc., (Schoolnet, 2013).

A survey of ICTs in schools in some European Union (EU) countries shows that laptops, tablets and netbooks are becoming pervasive; on average there are between 8 and 16 learners per laptop at grade 4. More than nine out of ten learners are in schools with broadband of 2 to 30mbps on average. Most schools have, at least, a website, email for learners and educators or a virtual learning environment (Schoolnet, 2013).

In developing countries, such as India and some other countries in South Asia, mobile phones are used to reinforce English language learning. Mobile phones are also used for support services for education, such as providing alerts, sending information updates and schedule appointments, just as they are done in The Virtual University in Pakistan and some other educational institutions (Infodev, 2010). A very important advantage of the use of ICT in education is the ability of these tools to provide a collaborative learning platform for educators and learners through which they can access learning

materials and share knowledge. According to Paynter and Bruce (2013), Moodle, a learning management system has also been reported to be an ICT promoting collaborative learning technique in many schools in Western Australia. Other ICT tools, for example, Wikispace, Microblogs, 3-D virtual world, online conferencing, Desk Top Video Conferencing (DTVC), interactive whiteboards, etc., are used to promote collaboration among learners. Cloud computing also has been reported to be increasing collaboration among learners without geographical restrictions (Johnson *et al.,* 2013).

According to Peters (2007), mobile phones also often play a vital role in the communication between the school management and the parents, such as their usage to SMS parents regarding attendance. The report by De Crom (2005), on the use of PDAs in learning, showed that PDAs enhanced learners' performance compared to the usage of textbooks. Another study by Khamkhien (2012) found that learners studying the English Language, with Computer Assisted Language Learning program, performed significantly better than those who studied using textbooks.

Also, ICTs help in learners' motivation and engagement towards learning. Interactive educational tools are made available by ICTs which improve learners' motivation to acquire basic skills such as reading. ICTs, such as video, computer animations, with graphic contents, and radio with songs and interesting sound effects compel the learner to pay attention to the learning content to be delivered by such devices. According to Don *et al.* (2003), educators reported that the usage of ICTs in teaching has led to an increase in pupils' motivation towards learning activities. Considering the different impacts of ICT in the education sector, easy access to learning materials is a major one. ICTs make it possible for learners to browse through e-books, sample examination papers, papers and journals from different authors and can also have an easy access to resource persons, mentors, experts, researchers, professionals, and peers-all over the world (Noor-Ul-Amin, 2009).

1.1.5.2 Cost and Adoption

The above paragraphs highlighted the advantages (motivation, collaboration, communication, and quick access to educational resources) of ICTs in education. On the other hand, however, the issue of cost is a great concern when using ICTs for teaching and learning. Extra funding is required for procurement, maintenance and repairs of ICTs, plus that of training and support services for educators. This is usually one of the major determinants of successful integration of ICT into education. Regions or institutions where this funding is not readily available become disadvantaged in terms of ICTs integration into teaching and learning. Moreover, technology changes frequently, so there will be need for periodical upgrades. Naismith *et al.* (2004) argue that, apart from ICT procurement costs, there are other costs incurred from service providers when the internet is used. The cost of providing one networked computer lab per school in the United States has been estimated at $305 per learner per year (Kozma, *et al.* 2000). According to Vigdor and Ladd (2010), a laptop provision program for all public secondary learners in the US. is estimated to cost $20 billion per year but this will be difficult to achieve in a developing or under developed world. Cost is one of the major factors contributing to the digital divide (Acilar, 2011; Van Dijk, 2008; Fuchs and Horak, 2008).

Due to the fact that some ICTs, especially computers, involve some form of literacy to operate, some potential users would rather opt for traditional tools to work with rather than ICTs. This can be traced to different factors like prior knowledge, training, attitude, confidence, and perceived ease of use, etc. Whenever these factors are negatively perceived, ICT adoption is less possible. According to (Postholm 2007), proficiency of educators is required for successful integration of ICTs into education; without it, learning with ICTs becomes a challenge for the learners (Postholm 2007). Many researchers have shown this to be a barrier to adoption of ICTs in the classrooms. According to Goktas *et al*. (2009), the majority of educators and deans believed that their lack of ICT knowledge is a major barrier for ICT integration

into their classrooms. This disadvantage is usually seen as the resultant effect of the negative attitude of educators towards ICT and their lack of ICT training (Bingimlas, 2009).

1.2 Problem Statement

There are clear indications from the above discussion that the pervasiveness of ICT in many domains of life allows for the improvement of outcomes and processes in domains such as communication, entertainment, commerce, manufacturing, health, education, etc. Such improvement includes better quality of service, fast and easy communication, improved manufacturing processes, positive economic growth, and easier access to educational resources. The question is, is this improvement obvious in the education sector of developing countries in terms of teaching and learning?

Although many developing nations have legislated some form of mandatory primary and secondary education (UN, 2005), the primary and secondary school learners, unfortunately, do not always make the transition to their respective higher levels. In fact, data from past national and international academic evaluations indicates that, in too many countries, pupils do not master fundamental skills, and low success rate is rampant. For example, a study by the Southern African Consortium for Monitoring Educational Quality found that more than half of sixth-graders in four out of seven countries achieve minimum competence in reading (Gillies and Quijada, 2008). Much hope has been placed in ICTs to help reduce these problems of poor academic performance in schools, by helping to transform the teaching and learning processes in order to strengthen the quality of education, considering the excitement derived by the youths when using ICTs. The problem of poor academic performance in schools, despite the advances made by ICTs, raises many possible research questions, research aims and research objectives that are similar to the ones pursued by this research as formulated in the following section.

1.3 Aim, Objectives and Research Questions

The first section of this chapter has overviewed the advantages and disadvantages of ICTs when used in various domains such communication, entertainment, commerce, governance and education, as presented by existing literature. This section now presents the aim, objective and research questions for this research on the perceptions of educators on the advantages and disadvantages of using ICTs in teaching and learning.

1.3.1 Main Research Question

The main research question for this study can be formulated as follows: What are the factors that affect the perceptions of educators on the advantages and disadvantages of using ICTs for teaching and learning or elearning, and which recommendations can be made to improve learners academic performance through elearning?

1.3.2 Research Sub-questions

The above mentioned main research question is further expressed by the following listed research sub-questions:

Research sub-question 1: What are the theories that can explain the perceptions of educators on the advantages and disadvantages of ICTs when used for teaching and learning purposes?

Research sub-question 2: How can the contributing factors to the perceptions of educators of the advantages and disadvantages of elearning be shaped into a hypothetical model?

Research sub-question 3: How can a hypothetical model of the factors affecting the perceptions of educators on the advantages and disadvantages of elearning be empirically validated?

Research sub-question 4: Which teaching and learning strategies can be proposed from the knowledge of the factors affecting the perceptions of educators on the advantages and disadvantages of elearning?

1.3.3 Research Aim

The aim of this study is to develop a model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in an attempt to contribute towards a solution to the problem of low performance in schools in developing countries.

1.3.4 Research Objectives

The above mentioned aim is further expressed by the following listed research objectives:

a) To select from existing literature suitable theories that can be applied to the examination of educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world;
b) To design a model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world;
c) To empirically test the above model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world; and
d) To propose recommendations on how to optimize the impact of the use of ICTs on teaching and learning based on the results of the current study.

1.4 Rationale

The rationale for doing this research can be explained by the following findings; according to Guri-Rosenblit and Gros (2011), "Unquestionably, demonstrating cost-effective models of utilizing the digital technologies constitutes a most urgent task for researchers, policy makers and practitioners", and Abrami *et al*. (2008), who state that "the biggest unanswered question for policy makers and practitioners' concerns whether e-Learning is worth the cost". In other words, this study is motivated by the need to research innovative ways towards insuring that the investments put into e-Learning start to bear their expected outcomes to the point where they

are able to significantly solve the problem of low academic performance in schools, especially in the context of developing countries.

1.5 Structure of the Dissertation

This dissertation is made up of five chapters. Each chapter is briefly described below:

Chapter 1: Introduction

This chapter presents the aim, objectives, research questions and rationale of this study on the factors affecting educators' perceptions on the advantages and disadvantages of elearning as an attempt to contribute towards a solution to the problem of poor academic performance in developing countries' schools. These advantages and disadvantages of elearning is introduced along with the general advantages and disadvantages of ICTs for various domains such as communication, entertainment, commerce, and governance.

Chapter 2: Literature Review

Theoretical frameworks related to teaching philosophies and to learning theories are presented in the second chapter of this dissertation. These theoretical frameworks are then analysed in order to identify some of their constructs that are then used for the design of a new theoretical model on educators' perceptions on the advantages and disadvantages of elearning in schools. This newly proposed theoretical model is then translated and explained in terms of research questions and research hypotheses.

Chapter 3: Research Design

The purpose of this chapter is to validate the theoretical model proposed, and to give a detailed description of the methods used in carrying out the survey, and the experiment conducted in this study on educators' perceptions on the advantages and disadvantages of elearning in schools.

Chapter 4: Research Results

In this chapter, the results of the survey and experiment carried out on the perceptions of educators on the advantages or disadvantages of elearning in schools are presented.

Chapter 5: Comparison, Recommendations, Summary and Conclusion

This chapter compares the research results of chapter four with existing empirical studies, and discusses strategies for the successful introduction of elearning in schools. It also looks at the implications of these research results on IT education. A summary of the study as well as possible avenues for future research is also presented in this chapter.

1.6 Conclusion

This study aims to determine the perception of educators on the advantages and disadvantages of elearning. This is the reason why this chapter started with an introduction of the advantages and disadvantages of Information and Communication Technologies (ICTs) in various domains where they are used such as communication, entertainment, commerce, governance and education, highlighting both the dark and the bright sides. Advantages such as speed, convenience, mobility, improved quality of service, motivation, collaboration and easy communication, among others, as well as disadvantages such as cost, health hazards, privacy violations, cybercrimes, information overload, and adoption problems were discussed.

Having discussed these advantages and disadvantages in general, there is a need to narrow them down to the education domain which is the main focus of this study. In other words, one is questioning to what extent the advantages of ICTs outweigh their disadvantages in the education domain to the point where they are able to resolve some of the main challenges faced by this sector. Examples of such challenges are: low access, low resources, low performance of learners and decline in the promotion rate from primary to secondary schools. This last challenge of low performance is the main

problem targeted by this study in terms of the perceived weight of the advantages and disadvantages of ICTs in education.

CHAPTER 2

REVIEW OF EXISTING THEORIES

The previous chapter laid a foundation for this dissertation by exploring the various advantages and disadvantages of ICTs in general. This chapter will now present relevant literature on theories and models related to teaching and learning, in order to achieve the first and the second objectives of this research. Let us recall that these two objectives are to choose from related literature suitable theories that can be used to determine the perceptions of educators' on the advantages and disadvantages of elearning and to design a model of the factors affecting the perceptions of educators on the advantages and disadvantages of elearning in schools in the developing world.

It is assumed that learning theories and teaching philosophies can be used to explain educators' perceptions on the advantages and disadvantages of elearning mainly because these theories and philosophies are aimed at exploring the best teaching and learning strategies. This explains why existing literature is looking at the link between learning theories and educators' teaching philosophies on one hand and use of technology for teaching and learning on the other hand. In fact, according to Judson (2006), educators' use of technology for instruction is guided by their teaching philosophy; and one can extend that statement from Judson (2006) by arguing that educators' use of technology for instruction is guided by their learning theory. The learning theories and teaching philosophies presented in this chapter include: Behaviourism, Cognitivism, and Constructivism, Transmissivism, Progressivism, and Self –regulation.

2.1 Learning Theories

Learning theories can simply be explained to be the different concepts that assist in revealing how people learn, which enables teaching professionals to remove barriers that hinder learning. Many theories have been developed to explain learning processes. The more popular ones include Behaviourism, Cognitivism and Constructivism.

2.1.1. Behaviourism

This theory suggests that a learner learns how to accomplish a given behaviour by observing, repeating, and adjusting to how the educators performs that behaviour, up to the full acquisition of the given behaviour. In other words behaviorism places the educator at the center of the acquisition of knowledge. In behaviourism, learners' motivation is kept alive through incentives such as rewards and punishment.

According to behaviourism, learners are able to respond to stimulations from their environment. The learners' mind is a clean slate at the beginning of a learning process with regards to what is to be learned, and learning is achieved through repetitive reinforcements of stimulations. Reinforcement can either be positive or negative. Positive reinforcement is used to encourage continuation of behaviour while the negative reinforcement is used to discourage behaviour. Behaviourists believe that all learners are able to learn if placed in the right environment.

A reminder of the purpose of this study seems opportune at this point. The study seeks to examine educators' perceptions on the advantages and disadvantages of elearning. It is probable that such perceptions are the consequence of educators' belief that elearning might interfere with the central role of educators in the learning process. This is one of the reasons why behaviourist theories are relevant to this study since these theories are based on the fact that educators are the unique knowledge givers.

There are different types of behaviourist theories, such as; Classical conditioning, Operant conditioning and Social learning.

Classical Conditioning

The classical conditioning learning theory as illustrated in Figure 2.1 was made prevalent by Ivan Pavlov (1849-1936) who posits that learning is achieved through the relation of an environmental stimulus and a naturally occurring stimulus. In his experiment on dogs, the environmental stimulus of a sound of ringing a bell was used to induce the naturally occurring stimulus of salivating as a reaction to appearance of food. For example, let's take a situation where a learner has to read a book in front of others and receive applause at the end of that exercise: this can help the learner to associate reading in public to the applause given afterwards, and hence get rid fear and anxiety of reading in front of others.

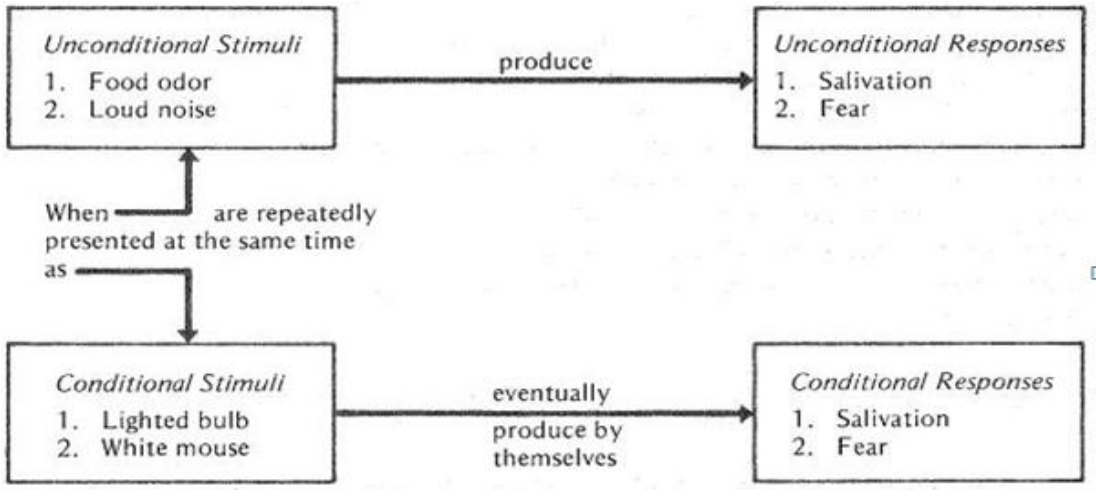

Figure 2.1: Classical conditioning
(Horan J. 1977)

Operant Conditioning

The Operant conditioning learning theory, as illustrated in Figure 2.2, is founded on the conviction that punishment and rewards are, respectively, the best ways to reinforce learning depending on the responses from the learner's behaviour. Skinner used pigeons and rats in his research to establish the fact that behaviours can be transformed in amazing ways through the use of rewards, which can be applied in all types of learning. For

example, a circus elephant has learned to stand on his hind legs moving around in a circle in an expectation of reward from the trainer. Skinner conducted laboratory experiments on a hungry rat placed in a box with a lever connected to food pellets and another that stops shock delivered to the box. Over time, the rat learnt of the right lever which delivers the desired pellets. Hence, it began to press the lever several times to dispense the pellets and also pressing the one that stops shocks from being delivered to the box. This experiment shows that as the rats' behaviour of pressing the levers (operant behaviour) is being modified by the reward (positive reinforcement) and pressing the other that stops shocks (negative reinforcement), people's behaviour can also be reinforced by desirable or undesirable outcomes (Peregoy and Maras, 2012).

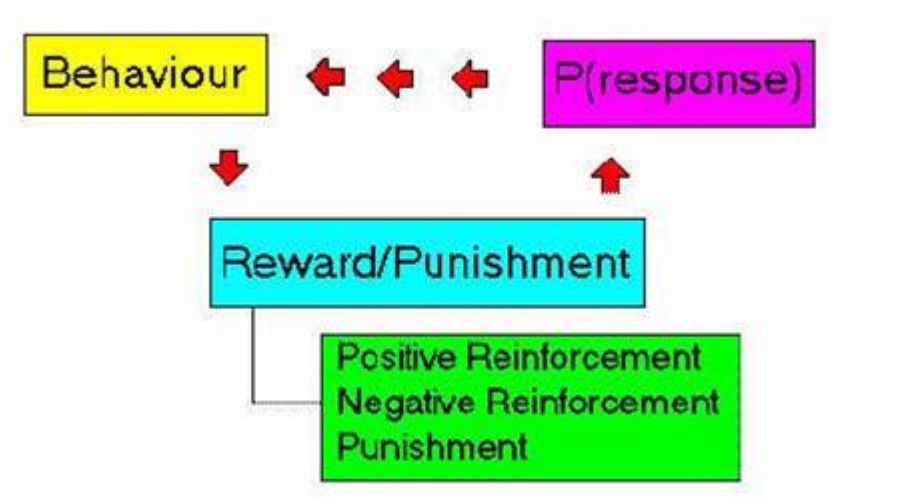

Figure 2.2: Operant conditioning

Social Learning

According to Bandura (1971), learning can be described as the outcome of processes whereby people observe and simulate the actions of one another, and the observer or learner is following the example of a credible instructor or trainer. Learning, in this case, in not achieved by rewards and punishment, as assumed by other behaviourist theories, but through the learner's ability to pay attention, memorise, rehearse, and to stay motivated.

2.1.2 Cognitivism

Cognitivism focuses on the mental processes that make learning possible, including deep thinking, memorising, and problem solving. Cognitive theories are mainly concerned with the “acquisition of knowledge” and with the “internal mental structures” of learners. During the acquisition of knowledge, learners receive, arrange, store, analyse, recall, and apply information in their minds (Ertmer and Newby, 2013).

It is also important to remember that the focus of this study is to examine the perceptions of educators on the advantages and disadvantages of elearning. It is likely for such perceptions to originate from the educators’ belief that elearning might interfere with learners’ mental processes. This is one of the reasons why cognitivist theories are relevant to this study since these theories focused on the mental processes that make learning possible.

2.1.3 Constructivism

The constructivist approach to learning is centered on the idea that learners reflect on their own previous experiences, their culture, their physical and social environment, and their focus and interests; in order to construct their own learning or be taught about the world around them (see Figure 2.3). It is believed that teaching and learning are facilitated by self-reflection and by self-understanding. In this case, learners are more active in the teaching and learning environment because knowledge acquisition depends more on personal experiences. The constructivist view of learning posits that knowledge is personally moulded and socially constructed by the learner’s interactions with his or her world (Jonassen, 1999). It can be said that constructivism and cognitivism are related based on the fact that they both share the view that mental activities are an important aspect of learning. However, these two learning theories differ on the fact that the mind is a “black box” of knowledge for cognitivists, but constructivists think that the mind filters different inputs from its surrounding world in order to create its own distinctive knowledge (Ertmer and Newby, 2013). The use of technology

in teaching and learning is embraced by this learning theory (Koohang *et al*., 2009; Stoke, 2009; Park, 2009).

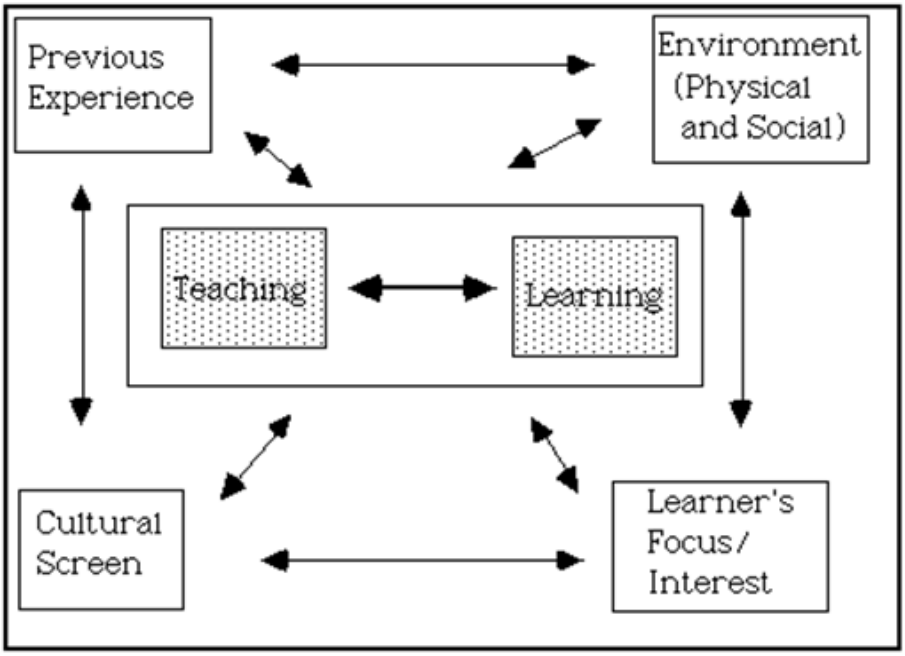

Figure 2.3 Constructivist learning theory (Hein, 1997)

A reminder of the purpose of this study seems opportune at this point. It seeks to examine educators' perceptions on the advantages and disadvantages of elearning. It is probable that such perceptions are the consequence of educators' belief that elearning might interfere with the central role of learners in the construction of knowledge. This is one of the reasons why constructivist theories are relevant to this study since these theories are based on the fact that learners construct their own knowledge.

Due to advancement in technology constructivist learning theory has been developed into different variants such as: social constructivism, connectivism, and situated learning (Ertmer and Newby 2013).

Social Constructivism

Social constructivists believe that learning does not only happen inside the mind of a human being, neither is it an inactive change of behaviours

moderated by external factors, but learning happens when people are involved in social and cultural activities such as conversations and collaborations (Molebash, 2002). In social constructivism, peers, family, educators, and the community all play a vital role in knowledge development (Patel *et al.,* 2011). Social constructivists claim that neither the educator nor the learner has absolute ownership of knowledge, but they co-participate in constructing it. Unlike in the traditional classroom where knowledge transfer is between educator and learner or from one learner to the other within the class, this theory credits learners with the ability to continue learning beyond the confines of the classroom.

Connectivism

Connectivism is a more recent constructivist learning theory that takes into account the impact of the use of technologies for teaching and learning as reflected by the following extract from Siemens (2005:1).

> *"Behaviorism, cognitivism, and constructivism are the three broad learning theories most often utilized in the creation of instructional environments. These theories, however, were developed in a time when learning was not impacted through technology. Over the last twenty years, technology has reorganized how we live, how we communicate, and how we learn. Learning needs and theories that describe learning principles and processes should be reflective of underlying social environments"*.

Connectivism (Figure 2.4) was developed to explain how people learn in a network driven environment, based on the premise that there exists an internal and external information network between learners, peers, experts, and diverse non-human sources (Siemens, 2006). This network creates a climate of connectedness, openness, diversity and autonomy, which facilitates learning and knowledge acquisition (Tschofen and Mackness, 2012).

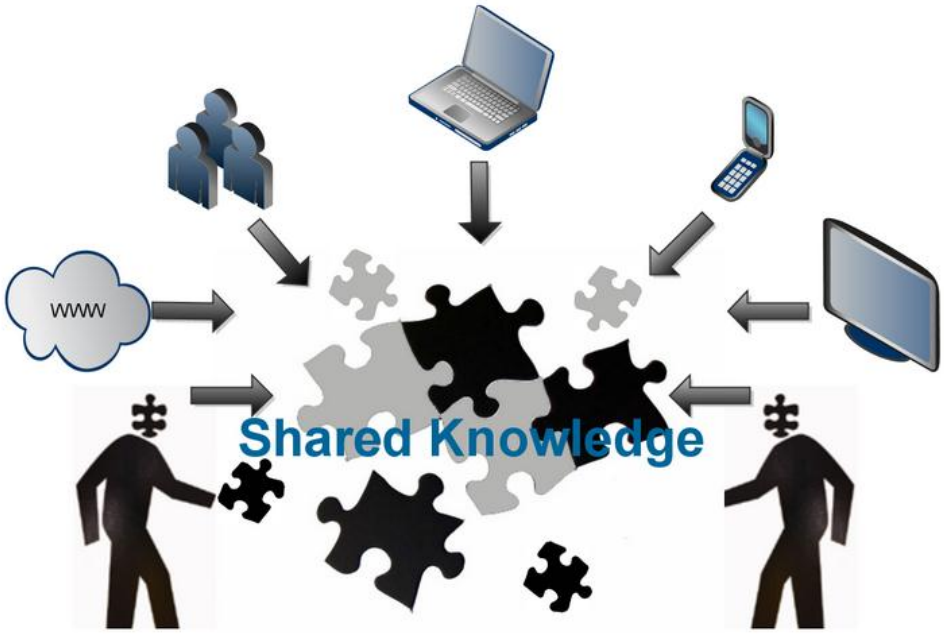

Figure 2.4: Connectivism learning theory (Paskevisius 2009)

Situated Learning

The situated learning theory describes how learning is achieved in a "community of practice", where members have different levels of experience within the community (Lave, 1991). This theory posits that learning unintentionally happens when a learner interacts and collaborates with different group members through a set of authentic activities within the community of practice whose aim is to work together towards solving a common problem. Learners usually start as novices in a community of practice and they gradually grow as experts depending on their level of participation within the community of practice. New learners usually handle peripheral tasks and this is called "legitimate peripheral participation" (Lave & Wenger, 1991).

2.1.4 Weaknesses of Learning Theories

Different critics have been raised against existing learning theories. Behaviorism is criticized for not taking into account the involvement of learners' minds in the learning process; hence its irrelevance for many forms

of learning. Cognitivism is also criticized for its inability to cater for learners' emotions and motivation as well as for the subjective experiences which are part of the learning process (Dai and Sternberg, 2004). Even the most popular and well accepted constructivism has its own fair share of criticism mainly because it does not acknowledge the fact it is almost impossible to put into context the learning needs of every individual learner (Karagiorgi and Symeou, 2005).

2.2 Teaching Philosophy

A teaching philosophy can simply be described as an educator's belief on how effective teaching should be done. The two main teaching philosophies are Transmissivism and Progressivism.

2.2.1 Transmissivism

Transmissivism portrays that educators are the main source of knowledge, and learners are passively receiving this knowledge from the educator. This is so because of the belief that the main purpose of education is to facilitate knowledge transfer from one generation to the next (Wild, 1995). In transmissivism, educators direct all classroom activities by giving instructions and ensuring that learners follow these instructions (Brann *et al*., 2005). Educators with a transmissive philosophy often argue that this teaching technique has always been reliable in the past, and it should be applied now and in the future. As a result, transmissive educators usually still prefer lecture format as the best mode of impacting knowledge on their learners (Brann *et al.,* 2005). This study seeks to examine educators' perceptions on the advantages and disadvantages of elearning. It is probable that such perceptions are the consequence of educators' belief that elearning might interfere with the role of the educator as the main source of knowledge. This is one of the reasons why transmissivism is relevant to this study since this theory is based on the fact that educators are solely responsible for knowledge transfer to the learners.

2.2.2 Progressive

Contrary to transmissivism, progressivism portrays a learner as an active participant in the learning process, and his or her own experiences are very important to learning. Fundamentally, the progressivist belief that the classroom as a learning environment, is a “practical and simplified version of society’’ (Jacobsen, 1999). Progressivism also advocates that the purpose of any class is to allow learners to arrive at their own conclusion through the application of different concepts or ideas developed from past experiences. Unlike with transmissive philosophy where the educator is the sole transmitter of knowledge, the educator plays the role of a consultant in the progressive education settings. Other principles of progressivism include collaborative learning, the active participation of learners in curriculum planning, learning by discovery, and creativity (Weber and Mitchell, 1996). The purpose of this study seeks to examine educators’ perceptions on the advantages and disadvantages of elearning. It is probable that such perceptions are the consequence of educators’ belief that elearning might interfere with the active role of learners in the learning process. This is one of the reasons why the progressivist theory is relevant to this study since this theory is based on the fact that learners actively participate in their own knowledge acquisition.

2.3 Self–Regulation Theory

According to Pintrich (1995), as cited by Hu and Driscoll (2013), self-regulated learning happens in three different steps. First, learners self-regulate their control of the teaching and learning resources available to them. Examples of such resources include the guidance received from peers and faculty members, time, and the study environment. Secondly, learners self-regulate their motivation towards meeting the demands of learning. Thirdly, learners self-regulate the use of their different cognitive abilities in order to achieve the learning outcomes required by these learning demands.

The aim of this study is to examine educators’ perceptions on the advantages and disadvantages of elearning. It is possible for such perceptions are driven

by the educators' belief that elearning might interfere with learners' self-control over their own learning process and resources available to them for learning. This is one of the reasons why this theory is relevant to this study since it's based on the fact that learners can self -regulate their learning goals and achievements.

2.4 Conceptual Model

The conceptual model (see Figure 2.5) designed by this study is the result of the selection of teaching and learning theories presented in the sections above in order to examine the perceptions of educators on the advantages and disadvantages of elearning. The fundamental hypothesis of this study is presented in Figure 2.5. This hypothesis states that the demographics of an educator affect his/her teaching and learning philosophies, as well as his/her perceptions on the advantages and disadvantages of elearning. Likewise, educators' teaching and learning philosophies affect their perceptions of the advantages and disadvantages of elearning. The next task now is to find out which teaching and learning theories are most suitable for the study?

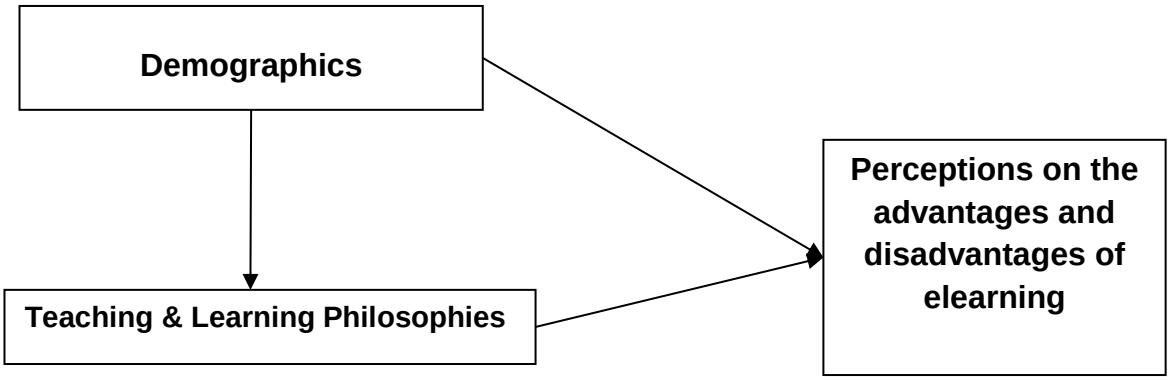

Figure 2.5: The Conceptual Model

2.5 A New Conceptual Model

Although this chapter overviews various teaching and learning theories and their relevance to this study, at this stage, progressivism, constructivism, and self-regulation theories will be selected as the constructs of the new conceptual model designed to examine the perceptions of educators on the advantages and disadvantages of elearning. Progressivism is selected from

teaching theories while constructivism and self-regulation are selected from learning theories (See Figure 2.6).

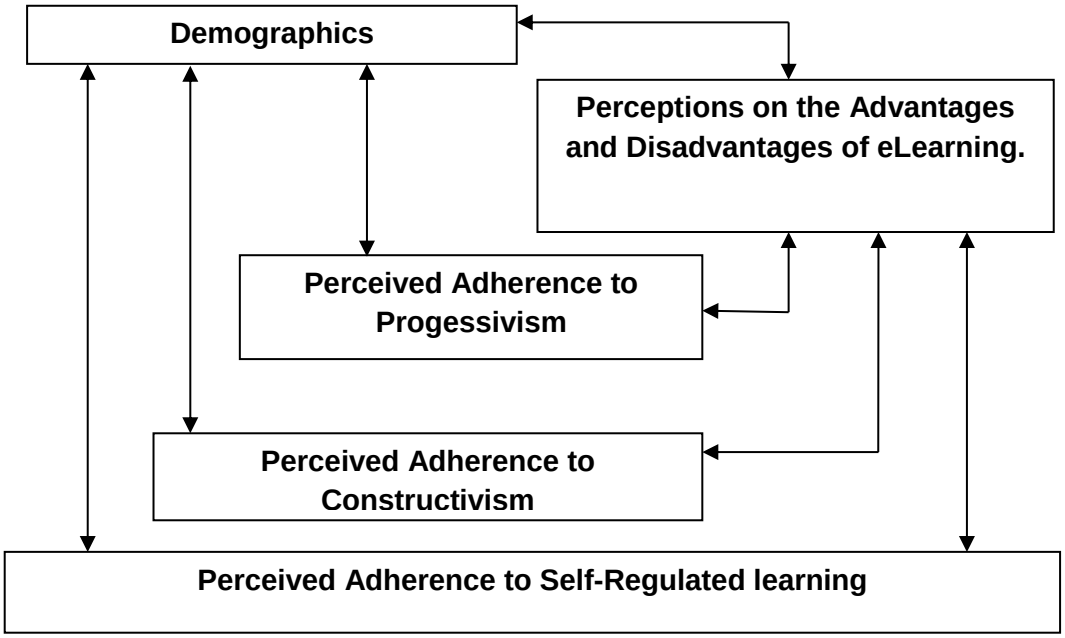

Figure 2.6: Model of educators' perceptions of advantages and disadvantages of eLearning.

The model presented in Figure 2.6 represents the following hypotheses to be empirically tested by the third objective of this study:

Ha0: The demographics of an educator have a direct relationship with his or her perceived adherence to self-regulated learning;

Hb0: The demographics of an educator have a direct relationship with his or her perceived adherence to progressivism;

Hc0: The demographics of an educator have a direct relationship with his or her perceived adherence to constructivism;

Hd0: The demographics of an educator have a direct relationship with his or her perceptions of the advantages and disadvantages of elearning;

He0: The perceived adherence of an educator to self-regulated learning has a direct relationship with his or her perceptions on the advantages and disadvantages of elearning;

Hf0: The perceived adherence of an educator to progressivism has a direct relationship with his or her perceptions on the advantages and

disadvantages of elearning; and

Hg0: The perceived adherence of an educator to constructivism has a direct relationship with his or her perceptions on the advantages and disadvantages of elearning.

2.6.1 Conclusion

This chapter presented the main teaching and learning theories including Behaviourism, Cognitivism, Constructivism, Transimissivism, Progressivism, and Self-Regulation theories, as part of the fulfilment of the first objective of this study, which is to select from existing literature suitable theories that can be applied to the examination of educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world.

Having discussed these theories and their relevance to this study, the next step consisted of working towards the achievement of the second objective of this study, which is to design a model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in schools. Progressivism, Constructivism, and Self-regulation theories were therefore selected as the constructs of this proposed model based on their suitability for the measurement of educators' perceptions on advantages and disadvantages of elearning. The rest of the dissertation will be dedicated to the empirical testing of this model.

CHAPTER 3

RESEARCH DESIGN

The precedent two chapters of this dissertation aim to achieve the first two objectives of this study, which are to select from existing literature suitable theories that can be applied to the examination of educators' perceptions on the advantages and disadvantages of elearning, and to design a model of the factors affecting educators' perceptions on these advantages and disadvantages. The current chapter focuses on the description of the survey conducted in this study to empirically test the conceptual model presented in chapter 2. In fact, this chapter is the description of the above mentioned survey in terms of its research population, its sampling, its data collection instrument, and its data analysis methods.

3.1 Research Population

The research population of this study is made up of educators from different primary and secondary schools in the Camperdown magisterial district of the Pinetown education district of the KwaZulu-Natal province of South Africa. The KwaZulu-Natal Province has a total number of 3,940 primary and secondary schools educators in 12 magisterial districts, with 584 of them in the Camperdown magisterial district (Department of Education, 2013) at the time of this research (June-July 2014). This survey covers educators of all ages, of any origin, and from all the grades of primary and secondary education in the Republic of South Africa (from grade R to grade 12); including educators with different levels of teaching experience both from urban and rural areas. The targeted educators were expected to belong to one of the following subject specializations; English, Mathematics, Science and Technology, and Social Science. They were also expected to hold a Diploma qualification, or a Bachelor's degree, an Honours degree, or a Master's degree.

3.2 Sampling Method

The sample size of the survey conducted by this study consists of 65 educators from 37 different schools in the Camperdown magisterial district. This sample was carefully selected using the stratified sampling method proposed by Naing *et al*. (2006) for finite populations as shown by the equation below, with the following values as parameters: Z = 1.96, P = 0.05, d = 0.048, and N = 584. This gives a sample size of 65.

$$n = \frac{Z^2 P(1-P)}{d^2(N-1) + Z^2 P(1-P)}$$

There are two types of schools in the Camperdown magisterial district: rural schools with 200 educators, and urban schools with 384 educators. The stratification of the sample of the 65 educators surveyed by this study was done as follows as shown in Table 3.1: the proportion of the number of educators from rural schools in the Camperdown rural magisterial district is 34% compared to the total number of educators in the Camperdown magisterial district, and the proportion of the number of educators from urban schools is 66% compared to the total number of educators in the Camperdown magisterial district. These proportions, when applied to the sample size 65, translate into a stratified sample size of 21 educators for rural schools and 44 educators for urban schools.

Table 3.1: Total Population and Sample Size of Camperdown educators

CAMPERDOWN

	Educators	Proportion	Sample Size
RURAL	200	0.34	21
URBAN	384	0.66	44
TOTAL	584	1	65

A further stratification was done both for rural schools and urban schools. The proportion of the number of educators from the big rural schools of the Camperdown rural magisterial district is 64% compared to the total number of

educators in the Camperdown magisterial district rural schools, and the proportion of the number of educators from the small rural schools is 36% compared to the total number of educators in the Camperdown magisterial district rural schools. These proportions when applied to the sample size of 21, translate into a stratified sample of 9 educators for small rural schools and 12 educators for big rural schools (see Table 3.2).

Table 3.2 Population and sample size of rural educators

	Educators	Proportion	Sample Size
Small Schools	72	0.36	9
Big Schools	128	0.64	12
TOTAL	200	1	21

Another stratification was also done both for urban schools. The proportion of the number of educators from the big urban schools of the Camperdown magisterial district urban schools is 62% compared to the total number of educators in the Camperdown magisterial district urban schools, and the proportion of the number of educators from the small urban schools is 38% compared to the total number of educators in the Camperdown magisterial district urban schools. These proportions when applied to the sample size of 44 translate into a stratified sample of 27 educators for the big urban schools and 17 educators for small urban schools (see Table 3.3).

Table 3.3: Population and sample size of urban educators

CAMPERDOWN URBAN			
	Educators	Proportion	Sample size
SMALL SCHOOLS	144	0.38	17
BIG SCHOOLS	240	0.62	27
TOTAL	384	1	44

For each of the six small rural schools of Camperdown, the ratio of the number of educators in the school was calculated in terms of the total

number of educators in the Camperdown small rural schools, and this ratio was multiplied by the sample size for the Camperdown small rural schools in order to get the number of educators to be included in the sample for that school. This sampling stratification method was applied to Camperdown big rural schools, small urban schools, and big urban schools as shown by Table 3.4, Table 3.5, Table 3.6 and Table 3.7. In each of the schools, the school's principal was requested to select which educators had to participate in the survey.

Table 3.4: Population and sample size of rural small schools

	SCHOOLS	Educators	Proportion	Sample
CAMPERDOWN RURAL SMALL SCHOOLS	RACING AND	8	0.11	1
	EMNGCWINI JP	8	0.11	1
	UKUSAKWABASHA	16	0.22	2
	CLIFFDALE	8	0.11	1
	EMPILWENI	16	0.22	2
	MABHILA PRIMARY	16	0.22	2
TOTAL		**72**	**1**	**9**

Table 3.5: Population and sample size of rural big schools

	SCHOOLS	Educators	Proportion	Sample
CAMPERDOWN RURAL BIG SCHOOLS	KEARSNEY	24	0.19	2
	ALBINI H	24	0.19	2
	GEORGE CATO	16	0.13	2
	HILLCREST	24	0.19	2
	NTSHONGWENI	28	0.22	3
	INCHANGA	12	0.09	1
TOTAL		**128**	**1**	**12**

Table 3.6: Population and sample size of urban small schools

	SCHOOLS	Educator	Proportion	Sample
CAMPERDOWN URBAN SMALL SCHOOLS	NCINCI JP	8	0.06	1
	INDLULAMITHI SP	8	0.06	1
	ENTENDELENI	4	0.03	1
	ZAMINHLANHLA SP	16	0.11	2
	WOZANAZO SP	8	0.06	1
	ENYOSINI JP	8	0.06	1
	HALALA SP	16	0.11	2
	INTANDO LP	20	0.14	2
	EKWENAMENI	4	0.03	1
	UBHEDU JP	8	0.06	1
	ISIQALO JP	20	0.14	2
	ESIHONQENI JP	8	0.06	1
	INGEDE SP	16	0.11	2
TOTAL		**144**	**1**	**17**

Table 3.7: Population and sample size of urban big schools.

	SCHOOLS	Educator	Proportion	Sample
CAMPERDOWN URBAN BIG SCHOOLS	KHALAWEMUKE	12	0.05	1
	UXOLOPHAMBILI S	12	0.05	1
	ELANGABINI JP	16	0.07	2
	NAZARETH PRIMARY	16	0.07	2
	VUKUZIPHATHE JP	12	0.05	1
	UKUSA SS	88	0.37	11
	ISIBUKOSEZWE H	12	0.05	1
	EMAXULWINI CP	16	0.07	2
	KWAMYEZA PRIMARY	12	0.05	1
	LUTHAYI H	12	0.05	1
	PHEZULU H	12	0.05	1
	SIKHETHUXOLO H	20	0.08	3
TOTAL		**240**	**1**	**27**

3.3 Data Collection Instrument

All the respondents of the survey conducted by this study were given a questionnaire to complete. This questionnaire was designed on the basis of the theoretical framework proposed by chapter 2 of this study. It consists of the following five Likert-scale variables apart from the demographic factor: perceived adherence to i) self-regulated learning, to ii) constructivism, to iii) progressivism, iv) educators perceptions on the advantages and disadvantages elearning, and iv) educators' demographics.

A. Demographics

The aim of this section of the questionnaire was to capture the demographic background of the respondents. The demographic items included in the questionnaire are the following:

- A1. Gender: The inclusion of this demographic item in the questionnaire helps with the identification of the gender of the research participants. Research participants had to choose between the male and the female option in order to specify their gender.
- A2. School location: The inclusion of this demographic item in the questionnaire helps with the identification of the location of the school of the research participants. Research participants had to choose between the urban and the rural option in order to specify their location.
- A3. Age group: The inclusion of this demographic item in the questionnaire helps with the identification of the age group of the research participants. Research participants had to choose between the following options in order to specify their age group: younger than 30, aged between 30 and 40, aged between 41 and 50, and older than 50 years.
- A4. Class or Grade: The inclusion of this demographic item in the questionnaire helps with the identification of the grade or class of the research participants. Research participants had to choose between the following options in order to specify their grade or class: from

grade R to grade 3, from grade 4 to grade 6, from grade 7 to grade 9, and from grade 10 to grade 12.

- A5. Class size: The inclusion of this demographic item in the questionnaire helps with the identification of the number of learners in the class taught by the research participants. Research participants had to choose between the following options in order to specify the size of their class: less than 20 learners, from 21 to 40 learners, from 41 to 60 learners, and more than 60 learners.
- A6. Highest level of education: The inclusion of this demographic item in the questionnaire helps with the identification of the highest academic qualification of the research participants. Research participants had to choose between the following options in order to specify their highest academic qualification: Diploma, Bachelor, Honours, and Masters.
- A7. Subject specialization: The inclusion of this demographic item in the questionnaire helps with the identification of the subject specialization of the research participants. Research participants had to choose between the following options in order to specify their subject specialization: Languages, Mathematics, Science and technology, or Social Science.
- A8. Computer usage: The inclusion of this demographic item in the questionnaire helps specify how frequently the research participant uses computers. Research participants had to choose between the following options in order to specify how frequently they use the computer: No usage, daily usage, weekly usage, and monthly usage.
- A9. Ethnicity: The inclusion of this demographic item in the questionnaire helps with the identification of the ethnic group of the research participants. Research participants had to choose between the following options in order to specify their ethnic group: African, Indian, Coloured, White, or Others. Others refer to any other ethnic group that is not listed.

- A10. Teaching experience: The inclusion of this demographic item in the questionnaire helps with the identification of the years of teaching experience of the research participants. Research participants had to choose between the following options in order to specify their years of teaching experience: less than 5 years of experience, from 6 to 10 years of experience, from 11-15 years of experience, from 16 to 20 years of experience, and more than 20 years of experience.

B. Educators' Perceptions on Learners' Self-regulation capabilities

The aim of this section of the questionnaire is to capture educators' perceptions on learners' ability to self-regulate their own learning. The list of items included in this section of the questionnaire is as follows:

- B1. Learners' ability to resist to distractions: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to follow their learning plans without distractions.
- B2. Learners' self-evaluation abilities: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to self-evaluate their performance and their progress when they are learning.
- B3. Learners' ability to achieve their goals: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to achieve their learning goals without the assistance of educators.
- B4. Learners' ability to learn from their mistakes: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to improve on their behaviour based on what they have learnt from their previous mistakes.
- B5. Learners' ability to take critical decisions: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to take crucial decisions without being guided by an adult.

- B6. Learners' ability to meet personal standards: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to set personal standards that they can live up to.
- B7. Learners' ability to handle unexpected situations: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to handle challenges in different situations.
- B8. Learners' ability to seek advice: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to seek advice when necessary.
- B9. Learners' willpower: The purpose of this questionnaire item is to identify educators' beliefs in the strength of the willpower of learners.
- B10. Learners' ability to make career plans: The purpose of this questionnaire item is to identify educators' beliefs on learners' ability to decide on the career that they want to embark on in future.

C. Educators' Perceived Constructivism

The aim of this section of the questionnaire is to identify educators' perceived adherence to constructivism. The list of items included in this section of the questionnaire is as follows:

- C1. Learners' ability to apply knowledge to different contexts: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to apply their knowledge to different contexts.
- C2. Learners' ability to take responsibilities for their learning: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to take responsibility for when and how they learn.
- C3. Learners' ability to maximise their potential: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to reach their maximum potential.
- C4. Learners' ability to improve thinking skills: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to keep on adjusting their thinking skills.

- C5. Learners' ability to analyse situations: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to look at situations from different perspectives.
- C6. Learners' ability to discover strategies for solving problems: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to come up with new strategies when faced with problems.
- C7. Learners' ability to relate educational knowledge to their daily life: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to construct knowledge based on daily life experience.
- C8. Learners' ability to improve their academic performance: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to self-improve their academic performance.
- C9. Learners' ability to connect different types of knowledge: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to establish relationships between different types of knowledge acquired from different sources.
- C10. Learners' ability to share their knowledge: The purpose of this questionnaire item is to identify educators' beliefs in the learners' ability to interact with others in order to share knowledge, experience, and ideas.

D. Educators' Perceived Progressive Teaching Philosophy

The aim of this section of the questionnaire is to identify educators' perceived adherence to progressive teaching philosophy. The list of items included in this section of the questionnaire is as follows:

- D1. Educators' beliefs on the effectiveness of teaching through the appraisals of the journals kept by learners: The purpose of this questionnaire item is to assess if educators believe that commenting on the journals kept by learners is an effective teaching practice.

- D2. Educators' beliefs on the effectiveness of teaching through the prioritization of cooperative work among learners: The purpose of this questionnaire item is to assess if educators believe that prioritizing learners' cooperative work (group or pair work) is an effective teaching practice.
- D3. Educators' beliefs on the effectiveness of teaching through learners' portfolios: The purpose of this questionnaire item is to assess if educators believe that giving feedback to learners on their portfolios is an effective teaching practice.
- D4. Educators' beliefs on the effectiveness of teaching through role playing, acting, and simulations: The purpose of this questionnaire item is to assess if educators believe that facilitating learning through activities such as role playing, acting, and simulation, is an effective teaching practice.
- D5. Educators' beliefs on the effectiveness of teaching through the analysis of sample cases: The purpose of this questionnaire item is to assess if educators believe that guiding learners in the analysis of sample cases which simulates learning situations is an effective teaching practice.
- D6. Educators' beliefs on the effectiveness of teaching through the interaction with learners during their presentations: The purpose of this questionnaire item is to assess if educators believe that the interaction with learners during their presentations is an effective teaching practice.
- D7. Educators' beliefs on the effectiveness of teaching through concept maps and diagrams to explain ideas: The purpose of this questionnaire item is to assess if educators believe that drawing concept maps and diagrams to explain ideas is an effective teaching practice.
- D8. Educators' beliefs on the effectiveness of teaching through the supervision of learners during self-discovery projects: The purpose of

this questionnaire item is to assess if educators believe that supervising learners during self-discovery projects is an effective teaching practice.

- D9. Educators' beliefs on the effectiveness of teaching through research projects: The purpose of this questionnaire item is to assess if educators believe that allowing learners to do research on various topics is an effective teaching practice.
- D10. Educators' beliefs on the effectiveness of using equipment for teaching: This questionnaire item is to assess if educators believe that using equipment is an effective teaching practice.

E. eLearning (ICTs) Advantages and Disadvantages

The aim of this section of the questionnaire is to identify educators' perceptions on the advantages and disadvantages of elearning. The list of items included in this section of the questionnaire is as follows:

- E1. ICTs' ability to contextualise learning: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the contextualization of learning.
- E2. ICTs' ability to avail more teaching and learning resources: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the availability of teaching and learning resources.
- E3. ICTs' ability to improve interactions between educators and learners: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to interactivity between educators and learners.
- E4. Impact of ICTs on social, moral and cultural practices: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to learners' adherence to social, moral and cultural standards.

- E5. Impact of ICTs on academic assessment: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the assessment of learners' academic performance.
- E6. Impact of ICTs on the provision of dedicated attention to the special needs learners: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the provision of dedicated attention to learners with special needs.
- E7. Impact of ICTs on educators' workload: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the alleviation of the educators' workloads.
- E8. Assessment of ICTs' technical problems: The purpose of this questionnaire item is to identify educators' beliefs on the resistance of ICTs with regards to technical problems.
- E9. Impact of ICTs on the cost of education: The purpose of this questionnaire item is to identify educators' beliefs on the contribution of ICTs with regards to the cost of education.
- E10. Assessment of ICTs health problems: The purpose of this questionnaire item is to identify educators' beliefs on the vulnerability of ICTs with regards to health problems.

3.4 Data Analysis

Data collected on the perceptions of educators on elearning was analysed using the Statistical Package for Social Sciences (SPSS) after being tested via Cronbach Alpha coefficients for reliability and validity. Readers are hereby reminded of the variables representing this data: educators' perceptions on learners' self-regulation capabilities, educators' perceived constructivism, educators' perceived progressive teaching philosophy, and their perceptions on elearning advantages and disadvantages. Descriptive and inferential analysis in terms of frequencies and means analysis was also carried out on the above mentioned variables, and on the demographic data of the educators. Inferential analysis was carried out in the form of Pearson's

correlation between the variables, then, linear regression equations were calculated for the variables with positive Pearson's correlations. ANOVA was used to test the impact of the demographic data of educators' perceptions on the advantages and disadvantages of elearning. All tests conducted by this study were subjected to a confidence level of 95% with a significant p-value between 0.00 and 0.05.

3.5 Conclusion

This chapter gives a description of the survey carried out on 65 educators selected by stratified sampling out of a population of 584 educators from the Camperdown magisterial district in the period between June 2014 and July 2014. This chapter also gives a detailed description of all the items in the questionnaire that were used for the collection of the survey data. The survey's questionnaire variables are: educators' demographics, perceptions of educators on learners' self-regulation capabilities, educators' perceived constructivism, educators' perceived progressive teaching philosophy, and educators' perceptions on elearning advantages and disadvantages. Examples of demographic items included in the questionnaire are: educators' age, their gender, their school location, and their ethnicity. Some of the questionnaire items on the educators' perceptions on learners' self-regulation capabilities are: educators' perceptions on learners' willpower, on learners' ability to achieve their goals, and on learners' ability to resist to distractions. Examples of questionnaire items on the perceived constructivism of educators are: educators' perceptions on learners' ability to improve their thinking skills, on learners' ability to share their knowledge, and on learners' ability to improve their academic performance. Some of the questionnaire items on educators' perceived progressivism are: educators' perceptions on the effectiveness of teaching through the use of sample cases, their perceptions on the effectiveness of teaching through the appraisal of the journals kept by learners, and their perceptions on the effectiveness of teaching through the prioritization of cooperative work among learners. Examples of questionnaire items on the educators' perceptions of elearning

advantages and disadvantages are: educators' perceptions on the impact of ICTs on the cost of education, their perceptions on the impact of ICTs on health and their perceptions on the impact of ICTs on educators' workload. The description by this chapter of the data analysis process for this study reveals that: SPSS was used for data analysis, the data was tested for validity and reliability using Cronbach alpha coefficients, means and frequencies were used for descriptive statistics; and Pearson correlations, ANOVA correlations, and ANCOVA correlations were used for inferential statistics. Research findings for all these statistical tests are presented in the next chapter.

CHAPTER 4

RESEARCH FINDINGS

This chapter presents the results of the tests conducted on the data collected by this study. These tests include data reliability and validity tests, as well as descriptive and inferential tests. It is important to remember that all these tests were carried out in order to achieve the third objective of this study. This objective seeks to empirically validate the new conceptual model presented in chapter 2 on the factors affecting the perceptions of educators on the advantages and disadvantages of elearning.

4.1 Data Validity and Reliability Results

As shown by Table 4.1 below, Cronbach's alpha (α) coefficients for all the variables for the collected data are greater than 0.7, which proves that these data sets are reliable.

Table 4.1: Reliability coefficients table for research variables

Research Variable	No of items	Cronbach's Alpha (a)
Perceived Self-Regulation	10	0.894
Perceived Progressivism	10	0.937
Perceived Constructivism	10	0.932
Perception on the Advantages and Disadvantages of elearning	10	0.924

4.2 Descriptive Statistics

Descriptive statistics, such as means and frequencies are summarized below for all the variables of this study starting with the demographics of the participants, up to the dependent variables on educators' perceptions on the advantages and disadvantages of elearning.

4.2.1 Demographics

Descriptive statistics on the demographics of the educators who participated in this study show that the overwhelming majority of these educators were females whose ages are evenly spread among the different groups (see Table 4.2). It is interesting to note that the size of most classes is manageable (between 21 and 40), and most educators are suitably qualified either in languages or in Mathematics. It is also interesting to note that almost the entire sample of educators is made up of Africans, almost half of the educators frequently use computers, and two thirds of the educators teach between grade R to grade 6 (See Table 4.2).

Table 4.2: Demographics of participants (educators)

A		Percentage (%)
A1	Male	9.2
	Female	90.8
A2	Urban	60
	Rural	40
A3	Less 30	20
	30-40	21.5
	41-50	36.9
	Above 50	21.5
A4	Grade R-3	33.8
	Grade 4-6	30.8
	Grade 7-9	12.3
	Grade 10-12	13.8
	Grade 4-6 Grade 7-9	6.2
	Grade 7-9 Grade 10-12	3.1
A5	1-20	4.6
	21-40	58.4
	41-60	23.1
	Above 61	13.8
A6	Diploma	41.5
	Bachelors	33.8
	Honors	24.6
A7	L	50.8
	M	9.2

	S&T	4.3
	SS	6.2
	L,M	9.2
	L,S&T	1.5
	L,SS	3.1
	M,S&T	6.2
	S&T,SS	4.6
	L,M,S&T	3.1
	L,M,S&T,SS	1.5
A8	None	58.4
	Daily	10.8
	Weekly	20
	Monthly	10.8
A9	African	90.7
	Indian	6.1
	White	1.5
	Others	1.5
A10	0-5Years	23
	6-10Years	18.5
	11-15Years	13.4
	16-20Years	18.9
	Above 20Years	26

4.2.2 Perceived Adherence to Self-regulated Learning

According to Table 4.3, a relative majority of the educators who participated in this study perceive themselves as non-adherents to self-regulated learning. Their opinions are neutral for all the self-regulated learning items except for the items on learners' career choices and on learners' ability to seek advice. Indeed, the majority of educators are in agreement with the fact that learners' know what they want to be in the future, and learners also have the ability to seek advice (See Table 4.3).

Table 4.3: Distribution table for Items on Educators' perceptions on Self-regulated learning

B	S1	S2	S3	S4	S5	Mean	SD
B1	22	20	14	25	20	3.02	1.463
B2	17	25	11	32	15	3.05	1.374
B3	25	25	23	15	12	2.66	1.338
B4	9	22	25	22	23	3.28	1.293
B5	17	28	18	17	20	2.95	1.397
B6	12	11	20	31	26	3.48	1.324
B7	18	20	23	25	14	2.95	1.328
B8	6	9	17	42	26	3.72	1.139
B9	5	20	29	29	29	3.34	1.122
B10	6	11	22	26	35	3.74	1.128
Average	13.7	19.1	20.2	26.4	20.8		

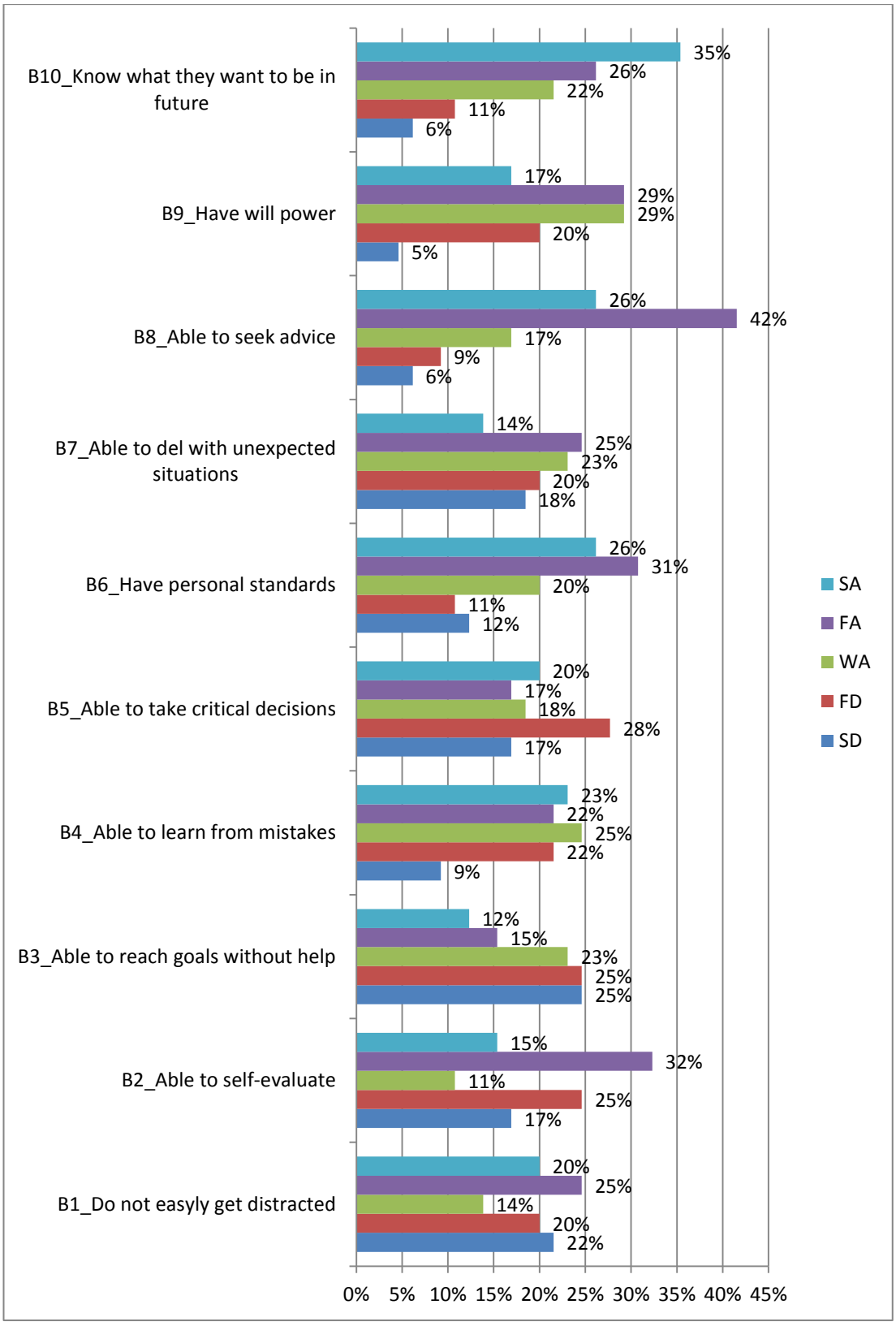

Figure 4.1: Distribution chart for Items on Educators' perceptions of Self-regulated learning

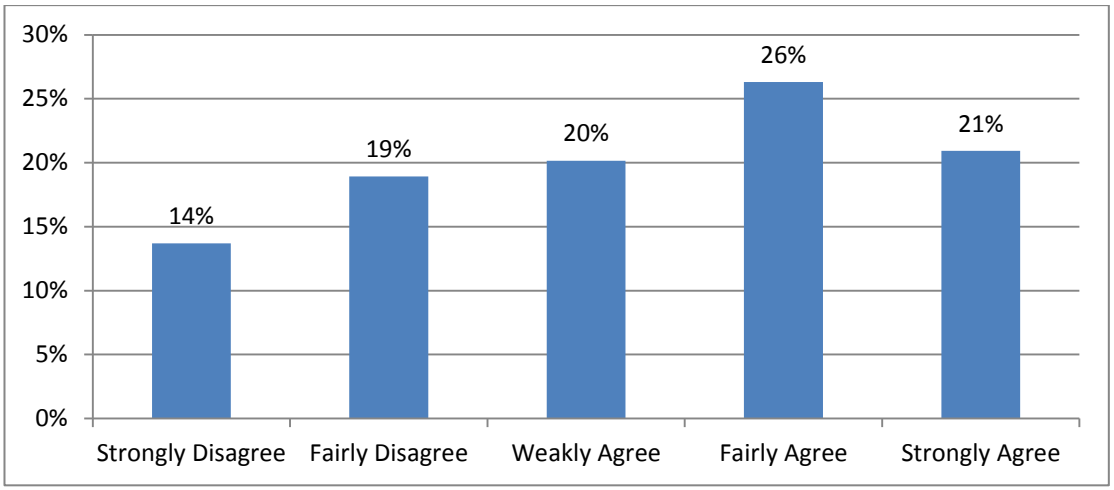

Figure 4.2: Overall distribution chart of educators' perceptions of self-regulated learning

4.2.3 Perceived Adherence to Constructivism

According to Table 4.4, the majority of the educators who participated in this study perceive themselves as adherents to constructivism. In fact, these educators are of the opinion that learners have the self-ability to reach all the objectives represented by the different constructivism items that were presented to them. Moreover, their beliefs are even stronger with regards to learners' self-ability to improve their thinking skills, to relate educational knowledge to their daily life, and to share knowledge (See Table 4.4).

Table 4.4: Distribution table for Items on Educators' perceptions on constructivism

C	S1	S2	S3	S4	S5	Mean	SD
C1	8	11	22	28	32	3.66	1.253
C2	5	14	28	25	29	3.60	1.183
C3	11	3	17	40	29	3.74	1.228
C4	8	8	15	25	45	3.91	1.271
C5	9	8	22	23	38	3.74	1.302
C6	9	11	22	28	31	3.60	1.285
C7	6	12	14	29	37	3.85	1.302
C8	6	11	18	29	35	3.77	1.222
C9	3	14	18	34	31	3.75	1.132
C10	3	9	18	32	37	3.91	1.100
Average	6.8	10.1	19.4	29.3	34.4		

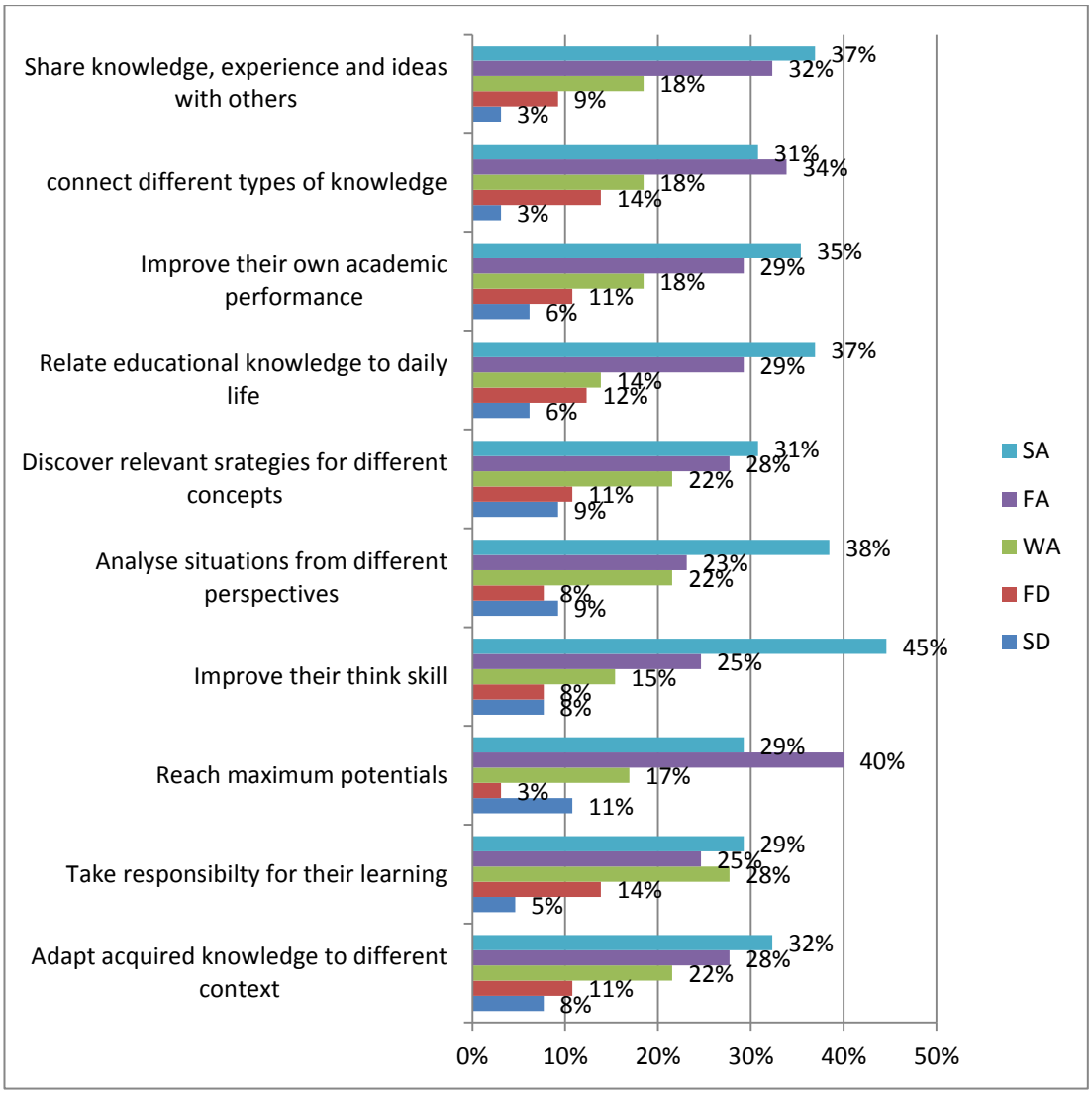

Figure 4.3: Distribution chart for Items on Educators' perceptions on Constructivism

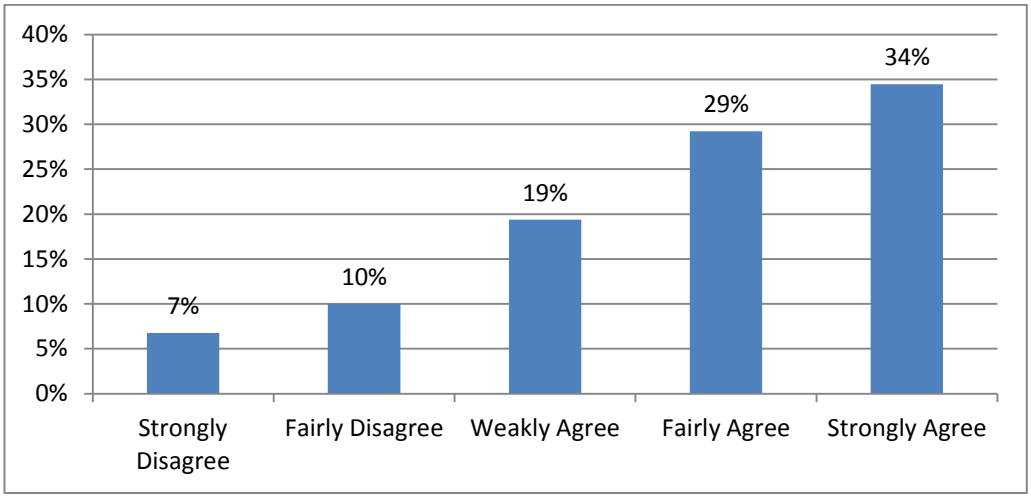

Figure 4.4: Overall distribution chart of educators' perceptions on constructivism

4.2.4 Perceived Adherence to Progressivism

According to Table 4.5, **t**he overwhelming majority of the educators who participated in this study perceive themselves as adherents to progressivism. These educators are indeed of the opinion that all the progressivism items that were presented to them fully contribute to effective teaching. Moreover, their beliefs are even stronger in respect to the effectiveness of the following teaching practices: giving feedback to learners on their portfolios, using various equipment to explain concepts, and making learners do research on various topics.

Table 4.5: Distribution table for Items on Educators' perceptions on progressivism

D	S1	S2	S3	S4	S5	Mean	SD
D1	6	6	9	25	54	4.14	1.197
D2	3	2	5	40	51	4.34	.889
D3	3	2	8	25	62	4.55	.867
D4	3	3	8	25	62	4.38	.979
D5	5	2	9	28	57	4.31	1.030
D6	3	5	6	15	71	4.46	1.017
D7	5	3	5	20	68	4.43	1.045
D8	5	3	3	26	63	4.40	1.028
D9	5	3	2	22	69	4.48	1.017
D10	2	3	5	15	75	4.60	.844
Average	4	3.2	5.4	24.1	63.9		

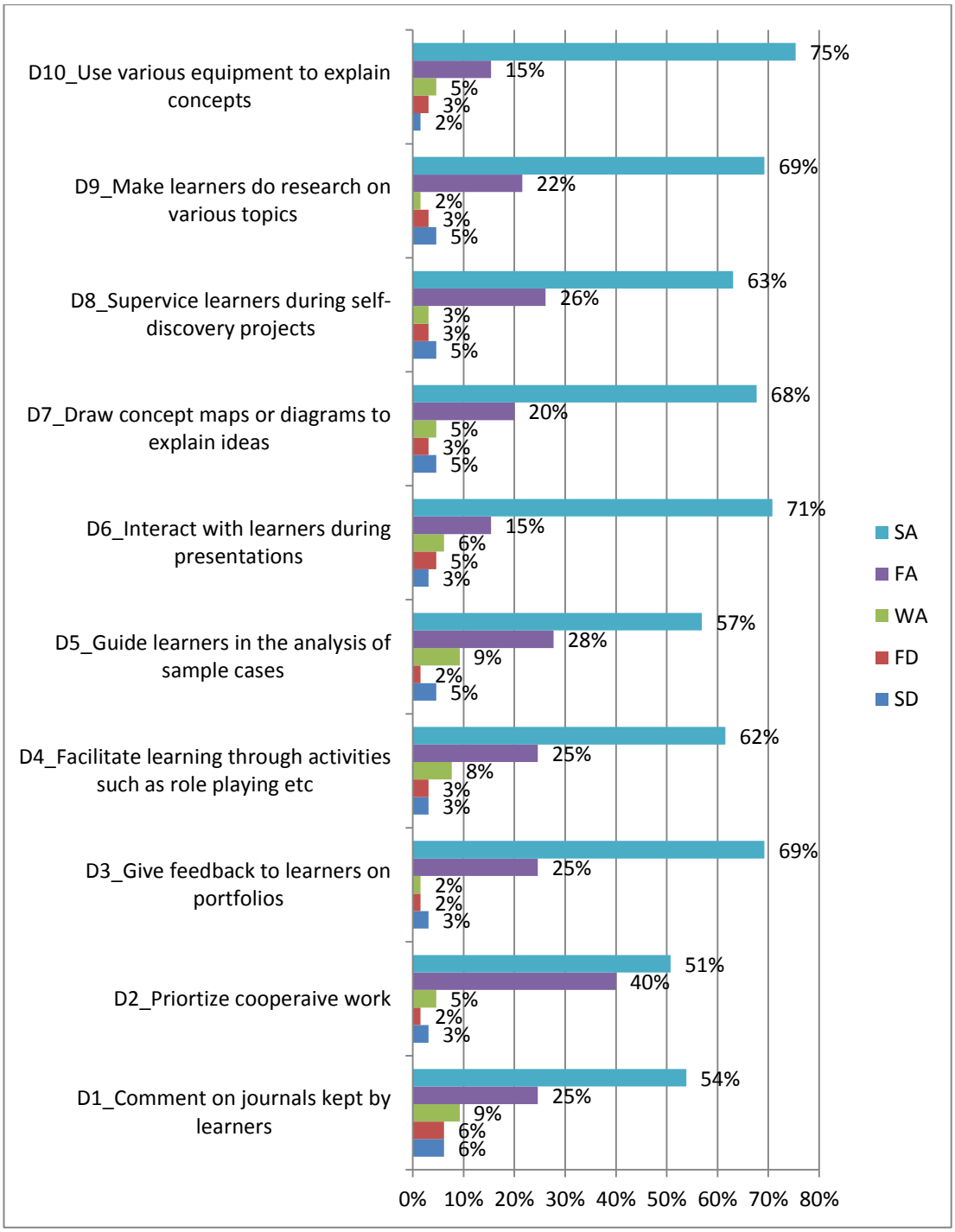

Figure 4.5: Distribution chart for Items on Educators' perceptions on Progressivism

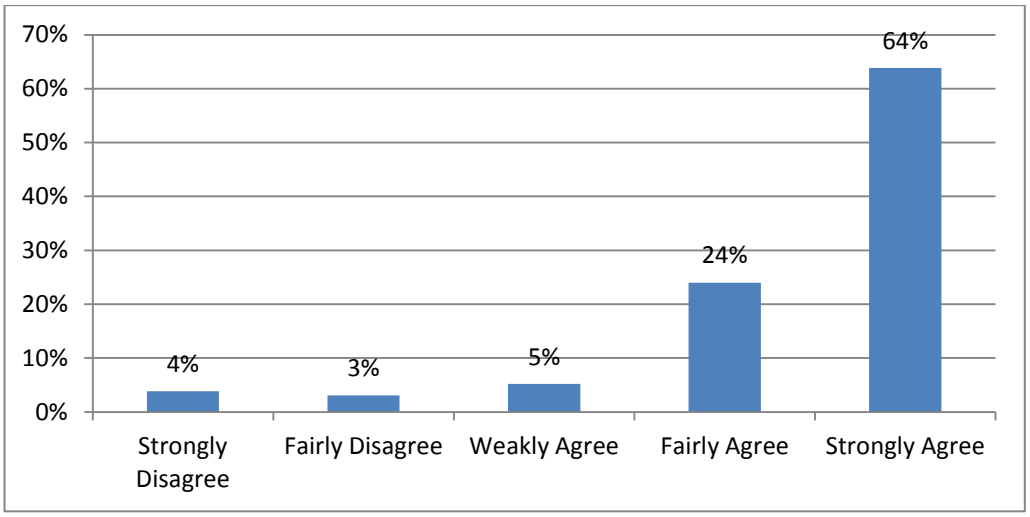

Figure 4.6: Overall distribution chart of educators' perceptions on progressivism

2.4.5 Perceptions on the Advantages and Disadvantages of eLearning

According to Table 4.6, **t**he overwhelming majority of educators who participated in this study indicated that ICT based teaching and learning is more advantageous than traditional teaching and learning. These educators are of the opinion that teaching and learning with ICTs is better than traditional teaching and learning for all the aspects described by the items in the questionnaire that was presented to them. Moreover, their beliefs are even stronger on the following advantages of using ICTs in teaching and learning compared to traditional teaching and learning: making teaching and learning resources more available, assessing learners' academic performance, allowing more interactions between educators and learners, and providing dedicated attention to special needs learners (See Table 4.6).

Table 4.6: Distribution table for Items on Educators' perceptions on Advantages and Disadvantages of eLearning

E	S1	S2	S3	S4	S5	Mean	SD
E1	2	9	6	31	52	4.23	1.027
E2	5	0	3	18	74	4.57	.935
E3	6	3	5	28	58	4.29	1.114
E4	5	6	11	35	43	4.06	1.102
E5	3	2	3	25	68	4.52	.886
E6	5	3	8	28	57	4.29	1.057
E7	6	8	8	20	58	4.17	1.232

E8	14	0	6	29	51	4.03	1.357
E9	12	3	8	32	45	3.94	1.333
E10	11	8	8	18	55	4.00	1.392
Average	6.9	4.2	6.6	26.4	56.1	4.21	

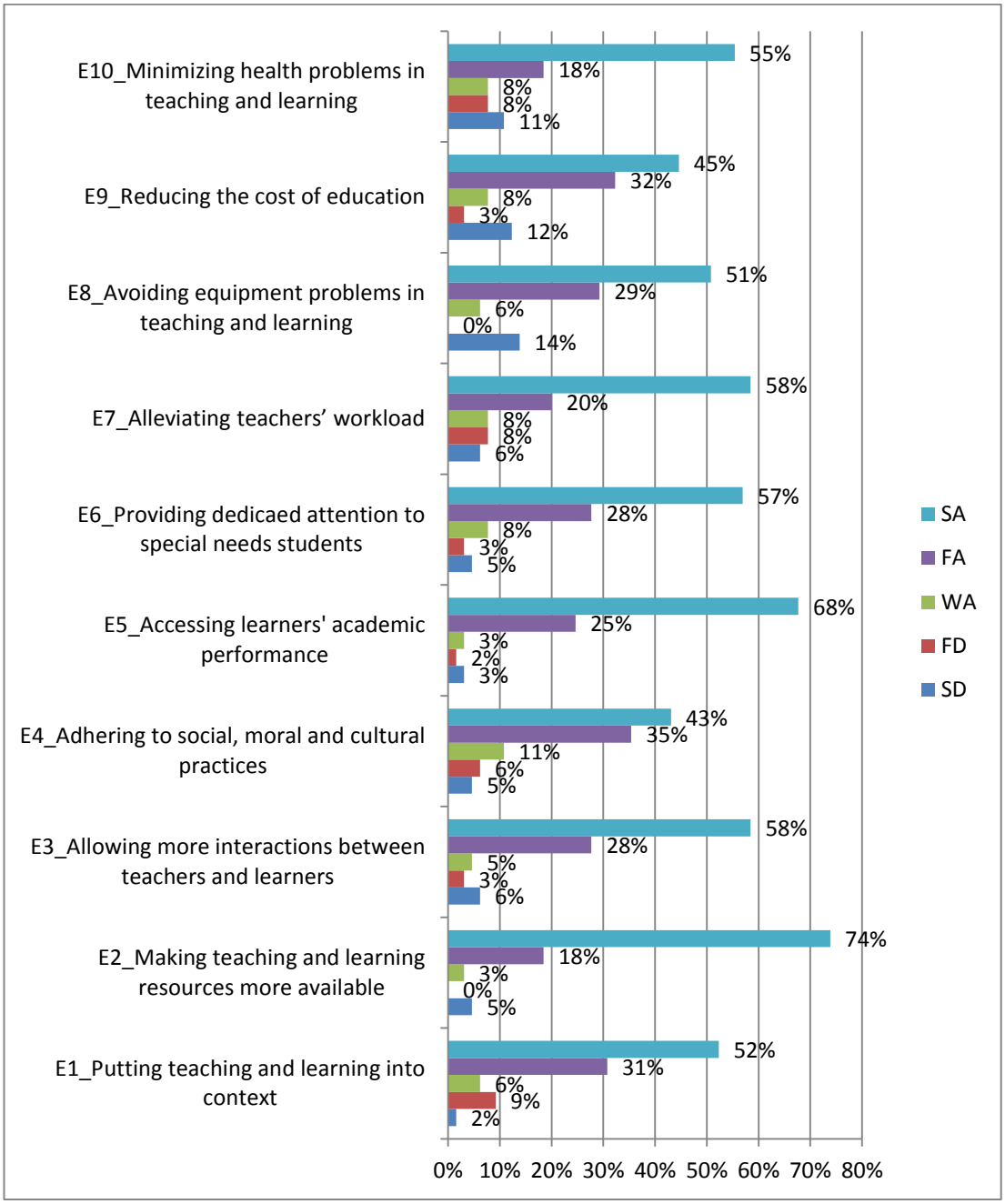

Figure 4.7: Distribution chart for Items on Educators' perceptions on Advantages and Disadvantages of eLearning

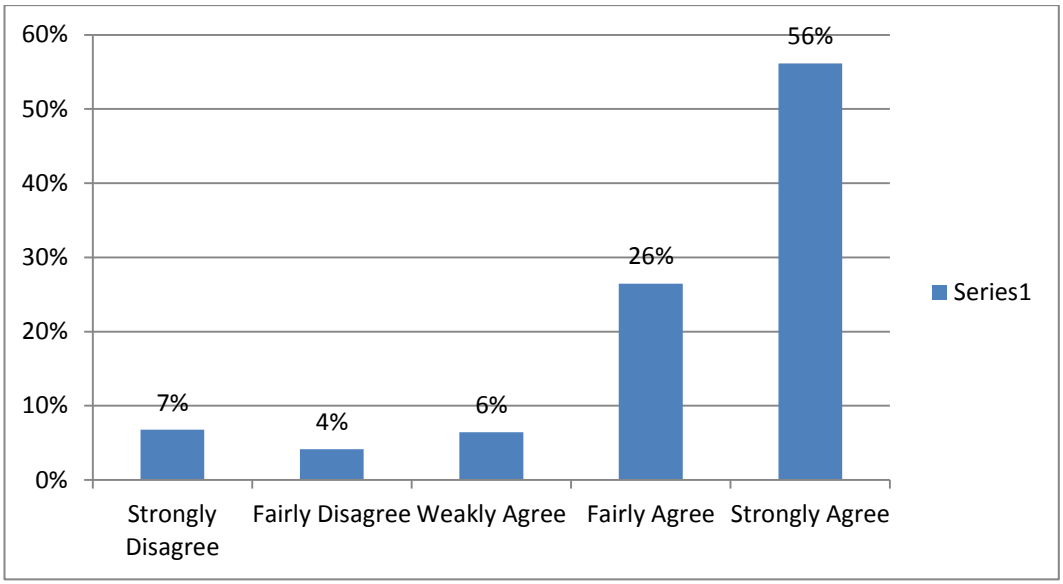

Figure 4.8: Overall distribution chart of educators' perceptions of advantages and disadvantages of eLearning

4.3 Inferential Statistics

ANOVA and Pearson correlation tests were performed on the survey data and the results of these tests are presented below.

4.3.2 ANOVA Tests Results

The interpretation of the results portrayed by the tables from Table 4.7 to Table 4.16 confirms the following hypothesis with a level of significance of 0.05:

- Fa0: The teaching experience of an educator has a direct relationship with his or her adherence to Self-regulated learning;
- Fb0: The grade or class taught by an educator has a direct relationship with his or her perceived adherence to progressivist teaching;
- Rb0: The ethnicity of an educator has a direct relationship with his or her perceived adherence to progressivist teaching;
- Fc0: The teaching experience of an educator has a direct relationship with his or her adherence to constructivism; and
- Fd0: The ethnicity of an educator has a direct relationship with his or her perceptions on the advantages and disadvantages of elearning.

Table 4.7: Anova test result for educators' gender

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	198,655	1	198,655	2,327	,132
	Within Groups	5379,130	63	85,383		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	65,323	1	65,323	,672	,415
	Within Groups	6122,893	63	97,189		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	148,579	1	148,579	2,465	,121
	Within Groups	3796,867	63	60,268		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	43,286	1	43,286	,542	,464
	Within Groups	5030,960	63	79,857		
	Total	5074,246	64			

Table 4.8: ANOVA test result for educators' school location

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	161,541	1	161,541	1,879	,175
	Within Groups	5416,244	63	85,972		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	196,741	1	196,741	2,069	,155
	Within Groups	5991,474	63	95,103		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	21,703	1	21,703	,348	,557
	Within Groups	3923,744	63	62,282		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	,208	1	,208	,003	,960
	Within Groups	5074,038	63	80,540		
	Total	5074,246	64			

Table 4.9: Anova test result for educators' Age group

		Sum of Squares	Df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	281,671	3	93,890	1,081	,364
	Within Groups	5296,114	61	86,822		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	418,508	3	139,503	1,475	,230
	Within Groups	5769,707	61	94,585		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	245,839	3	81,946	1,351	,266
	Within Groups	3699,607	61	60,649		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	599,347	3	199,782	2,723	,052
	Within Groups	4474,899	61	73,359		
	Total	5074,246	64			

Table 4.10: Anova test result for educators' Grade (class)

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	490,444	5	98,089	1,138	,351
	Within Groups	5087,340	59	86,226		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	968,915	5	193,783	2,191	,067
	Within Groups	5219,300	59	88,463		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	736,628	5	147,326	2,709	,029
	Within Groups	3208,818	59	54,387		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	500,400	5	100,080	1,291	,280
	Within Groups	4573,846	59	77,523		
	Total	5074,246	64			

Table 4.11: Anova test result for educators' current class size

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	270,578	3	90,193	1,037	,383
	Within Groups	5307,207	61	87,003		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	419,142	3	139,714	1,477	,230
	Within Groups	5769,074	61	94,575		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	323,783	3	107,928	1,818	,153
	Within Groups	3621,663	61	59,372		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	94,915	3	31,638	,388	,762
	Within Groups	4979,331	61	81,628		
	Total	5074,246	64			

Table 4.12: Anova test result for educators' Level of education

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	401,913	2	200,957	2,407	,098
	Within Groups	5175,871	62	83,482		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	318,916	2	159,458	1,684	,194
	Within Groups	5869,299	62	94,666		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	35,342	2	17,671	,280	,757
	Within Groups	3910,104	62	63,066		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	126,743	2	63,371	,794	,457
	Within Groups	4947,503	62	79,798		
	Total	5074,246	64			

Table 4.13: Anova test result for educators' level of education

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	793,186	10	79,319	,895	,544
	Within Groups	4784,598	54	88,604		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	951,420	10	95,142	,981	,471
	Within Groups	5236,795	54	96,978		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	374,120	10	37,412	,566	,834
	Within Groups	3571,326	54	66,136		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	476,360	10	47,636	,559	,839
	Within Groups	4597,886	54	85,146		
	Total	5074,246	64			

Table 4.14: Anova test result for educators' computer usage

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	43,069	3	14,356	,158	,924
	Within Groups	5534,716	61	90,733		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	55,416	3	18,472	,184	,907
	Within Groups	6132,799	61	100,538		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	77,758	3	25,919	,409	,747
	Within Groups	3867,689	61	63,405		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	146,740	3	48,913	,606	,614
	Within Groups	4927,506	61	80,779		
	Total	5074,246	64			

Table 4.15: Anova test result for educators' Age group

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	23,683	3	7,894	,087	,967
	Within Groups	5554,102	61	91,051		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	32,690	3	10,897	,108	,955
	Within Groups	6155,525	61	100,910		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	819,226	3	273,075	5,328	,003
	Within Groups	3126,220	61	51,250		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	916,615	3	305,538	4,483	,007
	Within Groups	4157,631	61	68,158		
	Total	5074,246	64			

Table 4.16: Anova test result for educators' teaching experience

		Sum of Squares	df	Mean Square	F	Sig.
Perceived_Self_Regulation	Between Groups	1027,150	4	256,788	3,386	,015
	Within Groups	4550,635	60	75,844		
	Total	5577,785	64			
Perceived_Constructivism	Between Groups	1121,154	4	280,288	3,319	,016
	Within Groups	5067,062	60	84,451		
	Total	6188,215	64			
Perceived_Progressive_Teaching	Between Groups	387,610	4	96,902	1,634	,177
	Within Groups	3557,837	60	59,297		
	Total	3945,446	64			
Advantages_and_Disadvantages	Between Groups	712,284	4	178,071	2,449	,056
	Within Groups	4361,963	60	72,699		
	Total	5074,246	64			

4.3.3 Differences Between Groups

The results of the ANOVA tests conducted by this study led to further tests on the comparison of the differences between the different groups of the demographic items that were found to affect other research variables. Table 4.17 and Table 14.18 indicate that educators with 6 to 10 years of teaching experience adhere more to self-regulated learning compared to educators with 16 to 20 years of teaching experience.

Table 4.17: Descriptive of differences between self-regulated learning and teaching experience groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-5	15	29,2000	7,26243	1,87515	25,1782	33,2218	17,00	40,00
6-10	12	37,3333	8,52092	2,45978	31,9194	42,7473	20,00	48,00
11-15	10	36,2000	9,89725	3,12979	29,1199	43,2801	21,00	48,00
16-20	11	26,0909	7,39533	2,22978	21,1227	31,0592	14,00	36,00
Above 20	17	32,7647	9,95320	2,41401	27,6472	37,8822	11,00	50,00
Total	65	32,1846	9,33557	1,15794	29,8714	34,4979	11,00	50,00

Table 4.18: Differences between groups (Self-regulated learning/Teaching experience)

Dependent Variable: Perceived Self-regulated Learning
Tukey HSD

(I) Teaching Experience		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-5	6-10	-8,13333	3,37292	,126	-17,6195	1,3529
	11-15	-7,00000	3,55537	,294	-16,9993	2,9993
	16-20	3,10909	3,45705	,896	-6,6137	12,8319
	Above 20	-3,56471	3,08507	,776	-12,2413	5,1119
6-10	0-5	8,13333	3,37292	,126	-1,3529	17,6195
	11-15	1,13333	3,72890	,998	-9,3541	11,6207
	16-20	11.24242*	3,63528	,024	1,0184	21,4665
	Above 20	4,56863	3,28355	,636	-4,6662	13,8035
11-15	0-5	7,00000	3,55537	,294	-2,9993	16,9993
	6-10	-1,13333	3,72890	,998	-11,6207	9,3541
	16-20	10,10909	3,80517	,073	-,5928	20,8110
	Above 20	3,43529	3,47071	,859	-6,3259	13,1965
16-20	0-5	-3,10909	3,45705	,896	-12,8319	6,6137

	6-10	-11.24242*	3,63528	,024	-21,4665	-1,0184
	11-15	-10,10909	3,80517	,073	-20,8110	,5928
	Above 20	-6,67380	3,36991	,288	-16,1515	2,8039
Above 20	0-5	3,56471	3,08507	,776	-5,1119	12,2413
	6-10	-4,56863	3,28355	,636	-13,8035	4,6662
	11-15	-3,43529	3,47071	,859	-13,1965	6,3259
	16-20	6,67380	3,36991	,288	-2,8039	16,1515

*.The mean difference is significant at 0.05 level.

Table 4.19 and Table 4.20 show that the level of adherence to progressivism for grade 7 to 12 educators is lower than that of educators from each of the following grades 4 to 6, 7 to 9, 10 to 12, and 4 to 9.

Table 4.19: Differences between groups (Perceived adherence to progressivism / Grade)

Dependent Variable: Perceived Progressivism
Tukey HSD

(I) Grade (Class)		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
R-3	4-6	-2,590909	2,278478	,864	-9,30200	4,12018
	7-9	-4,340909	3,044744	,711	-13,30898	4,62716
	10-12	-3,257576	2,918064	,873	-11,85252	5,33736
	4-6,7-9	-5,590909	4,008592	,730	-17,39792	6,21610
	7-9,10-12	14,409091	5,446604	,102	-1,63348	30,45166
4-6	R-3	2,590909	2,278478	,864	-4,12018	9,30200
	7-9	-1,750000	3,085074	,993	-10,83686	7,33686
	10-12	-,666667	2,960120	1,000	-9,38548	8,05215
	4-6,7-9	-3,000000	4,039310	,976	-14,89749	8,89749
	7-9,10-12	17.000000*	5,469251	,033	,89073	33,10927
7-9	R-3	4,340909	3,044744	,711	-4,62716	13,30898
	4-6	1,750000	3,085074	,993	-7,33686	10,83686
	10-12	1,083333	3,583478	1,000	-9,47153	11,63820
	4-6,7-9	-1,250000	4,516086	1,000	-14,55179	12,05179
	7-9,10-12	18.750000*	5,830242	,025	1,57746	35,92254
10-12	R-3	3,257576	2,918064	,873	-5,33736	11,85252
	4-6	,666667	2,960120	1,000	-8,05215	9,38548
	7-9	-1,083333	3,583478	1,000	-11,63820	9,47153
	4-6,7-9	-2,333333	4,431666	,995	-15,38647	10,71981
	7-9,10-12	17.666667*	5,765097	,037	,68600	34,64733

4-6,7-9	R-3	5,590909	4,008592	,730	-6,21610	17,39792
	4-6	3,000000	4,039310	,976	-8,89749	14,89749
	7-9	1,250000	4,516086	1,000	-12,05179	14,55179
	10-12	2,333333	4,431666	,995	-10,71981	15,38647
	7-9,10-12	20.000000*	6,386710	,031	1,18842	38,81158
7-9,10-12	R-3	-14,409091	5,446604	,102	-30,45166	1,63348
	4-6	-17.000000*	5,469251	,033	-33,10927	-,89073
	7-9	-18.750000*	5,830242	,025	-35,92254	-1,57746
	10-12	-17.666667*	5,765097	,037	-34,64733	-,68600
	4-6,7-9	-20.000000*	6,386710	,031	-38,81158	-1,18842

*.The mean difference is significant at 0.05 level.

Table 4.20: Descriptive of differences between self-regulated learning and teaching experience groups

	N	Mean	Std. Deviation	Std. Error	Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
R-3	22	42,40909	9,454951	2,015802	38,21700	46,60118	16,000	50,000
4-6	20	45,00000	4,424810	,989418	42,92912	47,07088	33,000	50,000
7-9	8	46,75000	4,891684	1,729471	42,66045	50,83955	39,000	50,000
10-12	9	45,66667	4,092676	1,364225	42,52076	48,81258	40,000	50,000
4-6,7-9	4	48,00000	1,825742	,912871	45,09484	50,90516	46,000	50,000
7-9,10-12	2	28,00000	25,455844	18,000000	-200,71169	256,71169	10,000	46,000
Total	65	44,09231	7,851598	,973871	42,14678	46,03784	10,000	50,000

Table 4.21 and Table 4.22 show that the level of adherence to constructivism for educators with 6 to 10 years of teaching experience in higher than that of educators with 16 to 20 years of teaching experience.

Table 4.21: Differences between groups (Perceived adherence to constructivism / Teaching experience)

Dependent Variable: Perceived constructivism

Tukey HSD

(I) Teaching Experience		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-5	6-10	-8,38333	3,55916	,142	-18,3933	1,6267
	11-15	-6,70000	3,75169	,391	-17,2515	3,8515

	16-20	3,65455	3,64794	,854	-6,6051	13,9142
	Above 20	-1,38824	3,25542	,993	-10,5440	7,7675
6-10	0-5	8,38333	3,55916	,142	-1,6267	18,3933
	11-15	1,68333	3,93480	,993	-9,3831	12,7498
	16-20	12.03788*	3,83601	,021	1,2493	22,8265
	Above 20	6,99510	3,46487	,270	-2,7497	16,7399
11-15	0-5	6,70000	3,75169	,391	-3,8515	17,2515
	6-10	-1,68333	3,93480	,993	-12,7498	9,3831
	16-20	10,35455	4,01528	,087	-,9383	21,6474
	Above 20	5,31176	3,66235	,598	-4,9884	15,6120
16-20	0-5	-3,65455	3,64794	,854	-13,9142	6,6051
	6-10	-12.03788*	3,83601	,021	-22,8265	-1,2493
	11-15	-10,35455	4,01528	,087	-21,6474	,9383
	Above 20	-5,04278	3,55599	,619	-15,0439	4,9583
Above 20	0-5	1,38824	3,25542	,993	-7,7675	10,5440
	6-10	-6,99510	3,46487	,270	-16,7399	2,7497
	11-15	-5,31176	3,66235	,598	-15,6120	4,9884
	16-20	5,04278	3,55599	,619	-4,9583	15,0439

*. The mean difference is significant at the 0.05 level.

Table 4.22: Descriptive of differences between Constructivism and Teaching experience groups

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
0-5	15	35,2000	8,27388	2,13631	30,6181	39,7819	22,00	49,00
6-10	12	43,5833	6,30236	1,81933	39,5790	47,5877	31,00	50,00
11-15	10	41,9000	6,04520	1,91166	37,5755	46,2245	31,00	49,00
16-20	11	31,5455	11,57034	3,48859	23,7724	39,3185	12,00	46,00
Above 20	17	36,5882	11,19184	2,71442	30,8339	42,3426	15,00	50,00
Total	65	37,5231	9,83315	1,21965	35,0865	39,9596	12,00	50,00

It is interesting to note that there were only one White, educator from the sample of this study, and the same applies for the “other” ethnic group. This is why these two educators were temporarily removed from the data in order

to run a new ANOVA test which, finally, did not find a relationship between educators' ethnicity and the other research variables.

4.3.4 Pearson Correlation Tests Results

Table 4.23 presents the results of the Pearson's correlation test carried out by this study. These results can be summarized as follows in terms of their confirmation or disconfirmation of the hypothesis set by the second chapter of this study.

- Fe1: The perceived adherence of an educator to self-regulated learning is not directly associated with his or her perceptions on the advantages and disadvantages of elearning;
- Ff0: The perceived adherence of an educator to progressivism is directly associated with his or her perceptions on the advantages and disadvantages of elearning; and
- Fg0: The perceived adherence of an educator to constructivism is directly associated with his or her perceptions of the advantages and disadvantages of elearning.

Table 4.23: Correlation table of variables not involving demographics

		B	C	D	E
B	Pearson Correlation	1	.746**	.272*	,195
	Sig. (2-tailed)		,000	,029	,120
	N	65	65	65	65
C	Pearson Correlation	.746**	1	.450**	.333**
	Sig. (2-tailed)	,000		,000	,007
	N	65	65	65	65
D	Pearson Correlation	.272*	.450**	1	.628**
	Sig. (2-tailed)	,029	,000		,000
	N	65	65	65	65
E	Pearson Correlation	,195	.333**	.628**	1
	Sig. (2-tailed)	,120	,007	,000	
	N	65	65	65	65

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The above Anova and Pearson correlation test results are fulfilling the third objective of this study, which is to empirically validate the conceptual model proposed in the second chapter of this dissertation. This empirically validated model is presented by Figure 4.9.

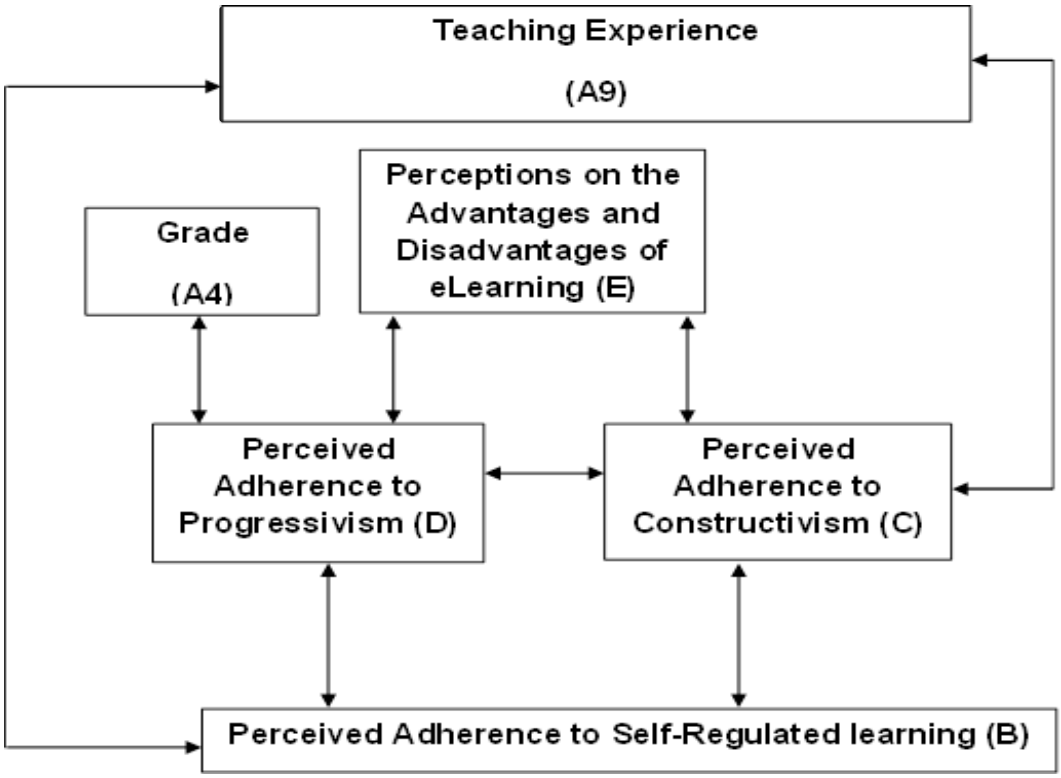

Figure 4.9: Validated Model

4.3.5 Linear Regression Test Results

A linear regression test was carried out in order to show how the dependent variable, educators' perception on the advantages and disadvantages of elearning, can be expressed as a linear function of the independent variables which were found to be related to it (Perceived self-regulated learning, constructivism and progressivism). The results are represented by Table 4.20 and are translated by Equation 4.1 which links educators' perceptions on

advantages and disadvantages elearning in schools with their perceived adherence to Self-Regulation, Constructivism and Progressivism.

Table 4.20: Linear Regression Table

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.272	5.345		1.922	.059
	Perceived_Self_Regulation	-.034	.143	-.036	-.239	.812
	Perceived_Constructivism	.083	.147	.092	.567	.573
	Perceived_Progressive_Teaching	.676	.127	.596	5.330	.000

a. Dependent Variable: Advantages_and_Disadvantages

Table 4.20 presents the results for the test of co-linearity regression between the dependent variable and the independent variables that were found to have a Pearson correlation between them. Unfortunately, according to Table 4.20, only one independent variable, perceived progressive teaching, is statistically significant for the co-linearity regression test. Therefore, another co-linearity regression test was done only between the dependent variable and the perceived progressive teaching variable, and its results are reflected by Table 2.21 and Equation 4.1

Table 4.21: Linear Regression Table

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10,712	4,979		2,151	,035
	Perceived_Progressive_Teaching	,712	,111	,628	6,403	,000

a. Dependent Variable: Advantages and disadvantages of eLearning

Equation 4.1: $E = 10.272 + 0.712*D$

Where E is Advantages and Disadvantages of elearning,and D is Perceived Progressive Teaching.

4.4 Conclusion

The results of the descriptive statistics on the demographics of the educators who participated in this study show that the overwhelming majority of these educators were females whose ages are evenly spread among the different age groups. The size of most classes taught by these educators is manageable (between 21 and 40), and most educators are suitably qualified with at least a Diploma either in languages or in Mathematics. It is interesting to note that the majority of these educators are Africans, almost half of whom frequently use computers, and two thirds of them teach between grade R to grade 6. Furthermore, the results of the inferential statistical tests carried out by this study show that among the demographic factors, only the years of teaching experience and the grade taught by an educator have a direct relationship with the other research variables of this study: an educator's years of teaching experience has a direct relationship with his or her perceived adherence to self-regulated learning and perceived constructivism, and an educator's class or grade has a direct relationship with his or her perceived adherence to progressivism. The next chapter will discuss these findings in comparison with those from existing empirical studies on the advantages and disadvantages of ICTs for teaching and learning.

CHAPTER 5

COMPARISON WITH RELATED LITERATURE, RECOMMENDATIONS, AND CONCLUSION

The empirical results of this study on educators' perceptions on advantages and disadvantages of elearning were presented in the previous chapter. This current chapter will now focus on the discussions of these results in comparison with empirical studies from existing literature on the advantages and disadvantages of ICTs on teaching and learning. Research gaps, recommendations for ICTs use by educators for teaching and learning, and recommendations for future research will also be presented at the end of this chapter, as planned by the fourth objective of this study.

5.1 Summary of the Current Empirical Study

The majority of the educators that took part in this study are females, whose ages are evenly spread among the different age groups (see Table 4.2). It is also obvious that the size of most classes is manageable (between 21 and 40), and most of the educators are of suitable qualifications in either languages or in Mathematics. It is also interesting to note that almost the entire sample of educators is made up of Africans, half of the educators frequently use computers, and two thirds of them are primary school educators. The majority of these educators agreed that they adhere to self-regulated learning, to constructivism, and to progressive teaching. They also strongly agree that elearning is advantageous. Furthermore, the inferential test results of the survey carried out in this study revealed that educators' teaching experience has a direct relationship with their adherence to self-regulated learning. There is also a direct relationship between the grade taught by an educator and his or her perceived adherence to progressivism in disfavour of grade 7-12 educators. Finally, the analysis of the perceptions of educators reveals that each of the following three variables has a direct relationship with the other two variables: perceived adherence to

constructivism, progressivism and educators' perceptions on the advantages and disadvantages of elearning.

5.2 Summary of Previous Empirical Studies

The literature review conducted by this study on the relationship between learning theories, teaching philosophy, self-regulated learning theory constructs and perceptions of the advantages and disadvantages of ICTs for teaching and learning is summarized in the following section. This summary consists of the presentation of descriptive statistics on the demographics of educators, and the presentation of inferential statistics on the relationship between educators' adherence to constructivism, to self-regulated learning, to progressivism, and their perceptions on the advantages and disadvantages of using ICTs in teaching and learning.

5.2.1 Inferential Results

This section briefly summarizes existing inferential results from literature, firstly, on the demographics of educators, and, secondly, correlations between educators' perceived adherence to constructivism and their perceptions on the advantages and disadvantages of using ICTs in teaching and learning. On the other hand, this study did not find papers on the relationship between educators' adherence to progressivism or self-regulated learning, and their perceptions the advantages and disadvantages of using ICTs for teaching and learning.

5.2.1.1 Effect of Educators' Demographics on Educators' Perceptions of the Advantages and Disadvantages of Using ICTS for Teaching and Learning.

Table 5.1: Inferential results on educators' demographics and perceptions of advantages and disadvantages of ICTs for teaching and learning.

Paper	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Hermans et al. 2008	Y		N							
Pierce and Ball 2009										N
Alazzam et al. 2012			N							
Wong et al 2012	N									
Sang et al 2010	N									
Huang and Hsu 2009	N									
Ismail et al 2013	Y								N	N
MacCallum 2009	N		Y							
Hsu et al 2007										Y
Teo, T. and Noyes, J. 2014	Y		Y							
Teo et al 2014	N		N							
Hamari and Nousiainen 2015	Y		Y							
Teo, T. 2014	Y									Y
Wikan and Molster 2011	Y		Y				Y			Y
Hrtonˇová, N., et al 2014	Y		N							

A1:Gender, A2:School location, A3:Age, A4:Grade, A5:Class size, A6:Level of education, A7:Subject specialization, A8:Computer usage, A9:Ethnicity, A10:Teaching experience. Y: Yes-correlated. N: No-correlations.

According to Table 5.1, the fifteen papers that were found from existing literature on the relationship between educators' demographics and their perceptions on the advantages and disadvantages of ICT usage in teaching and learning, seem to be silent on educators' demographics in terms of the location of their schools, the grade that they are teaching, the size of their class, their level of education, and their frequency of computer usage. On the other hand, among the twelve papers from Table 5.1 that are reporting on the relationship between educators' age and their perceptions on advantages of using ICTs for teaching and learning, seven papers found that educators' age has a relationship with their perceptions on the advantages and

disadvantages of using ICTs for teaching and learning (Hermans *et al.,* 2008; Alazzam *et al.,* 2012; MacCallum, 2009), while five papers found no relationships.

Among the eight papers that are reporting on the relationship between educators' gender and their perceptions of the advantages of using ICTs in teaching and learning, four papers found a relationship (Huang and Hsu 2009; Sang *et al.,* 2010; Wong *et al.,* 2012; MacCallum, 2009), while the other four did not find a relationship. The only paper (Wikan and Molster, 2011), from Table 5.1 which is reporting on the relationship between educators' subject specialization and their perceptions on advantages and disadvantages of using ICTs for teaching and learning, is validating that relationship. This is not the case for the only paper (Ismail *et al*., 2013) reporting on the relationship between educators' ethnicity and their perceptions on using ICTs for teaching and learning. Among the five papers that are reporting on the relationship between educators' years of teaching experience and their perceptions on the advantages and disadvantages of using ICTs for teaching and learning, three papers (Hsu *et al,* 2007; Wikan and Molster 2011; Teo, T. 2014,) found a relationship while two papers found no relationship (Pierce and Ball, 2009; Ismail et al 2013).

5.2.1.2 Effect of Educators' Perceived Adherence to Constructivism on their Perceptions on the Advantages and Disadvantages of using ICTs in Teaching and Learning

Table 5.2: Review of literature on relationships between Educators' Adherence to Constructivism and their perceptions on advantages and disadvantages of using ICTs for teaching and learning

	Correlation with Dependent variable	Descriptive Demographics									
Authors	Adherence to Constructivism	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Hermans *et al.,* 2008	Y	R		R							
Tondeur *et al.,* 2008	Y	R		R							
Sang *et al.,* 2010	Y	R						R			

Prestridge, 2012	Y	R		R							
Petko, 2012	Y	R		R							R
Liu, 2011	Y	R		R							
Teo *et al.,* 2008	Y	R		R							

Y: Yes-related, R: Reported

Table 5.2 indicates that seven papers (Hermans *et al.,* 2008; Tondeur, 2008; Sang *et al.,* 2010; Prestridge, 2010; Petko, 2012; Liu, 2011; Teo *et al.,* 2008) were found from a literature review of existing papers on the relationship between educators' perceived constructivism and their perceptions on the advantages and disadvantages of using ICTs for teaching and learning, and all these seven papers are of the view that such a relationship in fact does exist.

5.2.2 Descriptive Results

This section briefly summarizes existing descriptive results from literature, firstly, on the comparison between e-learning and traditional teaching and learning, secondly, on the perceived adherence of educators to teaching philosophies such constructivism, progressivism, and self-regulated learning, and, finally, on the demographics of the participants of these studies.

5.2.2.1 Advantages and Disadvantages of e-Learning Compared to Traditional Learning

Readers are reminded that the following items were used by this research to measure how ICTs can be more advantageous than traditional teaching and learning:

E1 Putting teaching and learning into context;

E2 Making teaching and learning resources more available;

E3 Allowing more interactions between educators and learners;

E4 Adhering to social, moral and cultural practices;

E5 Assessing learners' academic performance;

E6 Providing dedicated attention to special needs learners;

E7 Alleviating educators' workload;

E8 Avoiding equipment problems in teaching and learning;

E9 Reducing the cost of education; and

E10 Minimizing health problems in teaching and learning;

Findings based on these items from existing literature on educators perceptions on the advantages and disadvantages of using ICTs for teaching and learning are hereby presented in the Table 5.3.

Table 5.3: Review of literature on advantages and disadvantages of ICTs in teaching and learning

Papers	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E
MacCallum, 2009									D		
Getenet, 2013											A
Lin and Yinus, 2012								D			
Raman and Mohamed, 2013		A						D	D		
Shah, 2015								A			A
Kale and Goh, 2012					A	A	D				A
Persson and Mylono, 2014	A	A				A			D	D	
Yunus *et al*., 2013	A	A									
Sanchez and Aleman, 2011	A	A	A				D				A
Thinyane and Thone, 2012								D	A		
Selwood and Pilkington, 2005							A				
Yang and Teng, 2014		A	A					D		A	
Shraim and Khailf, 2010	A	A	A				D		A		A
Turel and Johnson, 2012			A								
Jwaifell and Gaysaymeh, 2013											A
Najafabadi *et al.,* 2013								D			
Miller *et al.,* 2006								D			
Raichel, 2012			A					D			
Bertram and Waldrip, 2013	A	A						D			
Domingo and Marques, 2010	A	A									

A: Agree/Advantage, D: Disagree/Disadvantage.

Table 5.4: Demographics of educators from reviewed literature on advantages and disadvantages of ICTs in teaching and learning

Papers	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
MacCallum, 2009	R		R							
Getenet, 2013	R		R			R				R
Lin *et al.,* 2012										
Raman and Mohamed, 2013	R									
Shah, 2015	R		R	R						
Kale and Goh, 2012	R	R	R	R						
Persson and Mylono, 2014	R		R	R			R			R
Yunus *et al.,* 2013	R		R							R
Sanchez and Aleman, 2010										

Thinyane and Thone, 2012	R									
Selwood and Pilkington, 2010										
Yang and Teng, 2014										
Shraim and Khailf, 2010	R		R					R		
Turel and Johnson, 2012	R		R				R			R
Jwaifell and Gaysaymeh, 2013						R	R			R
Najafabadi *et al.,* 2013	R					R		R		
Miller *et al.,* 2006	R									R
Raichel, 2012	R						R			R
Bertram and Waldrip, 2013			R							R
Domingo and Marques, 2010										

R: Reported.

According to Table 5.3, existing literature seems to be silent as to whether educators perceive e-Learning as more advantageous or not compared to traditional teaching and learning in terms of its impact on learners' adherence to social, moral and cultural practices. Moreover, only one of the reviewed papers reported on the perceptions of educators on whether e-Learning is more advantageous or not compared to traditional teaching and learning in terms of its impact on the assessment of learners' academic performance; and that paper is in favour of e-Learning (Kale and Goh, 2012).

Two of the reviewed papers reported on educators' perceptions on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of the provision of dedicated attention to learners with special needs (Kale and Goh, 2012; Persson and Mylono, 2014), and these papers are in support of e-Learning. Two other papers reported on educators perceptions as to whether e-Learning is better than traditional teaching and learning in terms of minimizing health problems in teaching and learning (Yang and Teng, 2014; Persson and Mylono, 2014) and their results are contradictory with the former supporting e-Learning, and the latter supporting traditional teaching and learning.

A fifth of the papers reviewed in Table 5.3 are reporting on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of the alleviation of educators' workload, and these papers are all in support of e-Learning (Kale and Goh, 2012; Sanchez and Aleman, 2010; Selwood and Pilkington, 2010; Shraim and Khailf, 2010). Similarly, approximately a fifth of the reviewed papers is reporting on whether or not e-

Learning is better than traditional teaching and learning in terms of allowing more interactions between educators and learners, and all these papers are in support of e-Learning (Sanchez and Aleman, 2010; Yang and Teng, 2014; Shraim and Khailf, 2010; Turel and Johnson, 2012). Approximately a third of the reviewed papers are reporting on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of putting teaching and learning into context, and all of these papers are in support of e-Learning (Persson and Mylono, 2014; Yunus *et al.,* 2013; Sanchez and Aleman, 2010; Shraim and Khailf, 2010; Bertram and Waldrip, 2013; Domingo and Marques, 2010).

Two fifth of papers reviewed are reporting on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of making teaching and learning resources more available, and all of these papers are in support of e-Learning (Raman and Mohamed, 2013; Persson and Mylono, 2014; Yunus *et al.,* 2013; Sanchez and Aleman, 2010; Yang and Teng, 2014; Shraim and Khailf, 2010; Bertram and Waldrip, 2013; Domingo and Marques, 2010). Almost half of the papers reviewed are reporting on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of the immunization equipment problems in teaching and learning and all of these papers support e-Learning (Lin *et al.,* 2012; Raman and Mohamed, 2013; Thinyane and Thone, 2012; Yang and Teng, 2014; Najafabadi *et al.,* 2013; Miller *et al.,* 2006; Raichel, 2012; Bertram and Waldrip, 2013) except for the paper by (Shah, 2015) that supports traditional teaching and learning.

A quarter of the reviewed papers are reporting on whether or not e-Learning is more advantageous than traditional teaching and learning in terms of reducing the cost of education and Thinyane and Thone (2012) and Shraim and Khailf (2010) support e-Learning, while MacCallum (2009); Raman and Mohamed (2013); and Persson and Mylono (2014) support traditional teaching and learning. Finally, a third of the papers 1n Table 5.3 actually report on the overall general perceptions of educators and on the comparison between ICT based teaching and learning and traditional teaching and

learning, finding the former more advantageous than the latter (Getenet, 2013; Shah, 2015; Kale and Goh, 2012; Sanchez and Aleman, 2010; Shraim and Khailf, 2010; Jwaifell and Gaysaymeh, 2013).

5.2.2.2 Educators' perceived adherence to teaching and learning philosophies such as constructivism, Self-Regulated learning, and Progressivism

Table 5.5: Descriptive results from existing literature on educators' perceived adherence to teaching and learning philosophies

	Indep. Variables			Demographics									
Authors	B	C	D	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Spruce and Bol, 2014	H			R		R	R		R	R		R	R
Kit lin lau, 2012	H			R									R
Davis & Neitzel, 2011	L								R				R
Toussi & Ghanizadeh, 2012	H			R		R				R			R
Ghonsooly *et al* 2011	H			R		R			R				R
Dignath-van and Werf, 2012	H			R		R	R						R
Osin, 2014		A				R						R	R
Al-Amoush *et al.,* 2013		L		R		R							
Uzuntiryaki *et al*., 2009		H				R							
Savasci & Berlin, 2012		H		R	R	R	R		R	R			R
Tertemiz & Okut, 2014			A			R							
Erbas, 2013			H	R		R				R			
Yilmaz *et al*., 2011			H	R					R				

B:Self-regulated learning, C:Constructivism, D:Progressivim, H:High, A:Average, L:Low, R:Reported.

According to Table 5.5, this study found thirteen (13) papers from the existing literature on educators' adherence to teaching and learning philosophies. Among the four papers that are reporting on educators' perceived adherence to constructivism, two found that educators' perceived adherence to constructivism is high (Savasci & Berlin 2012, Esen et al., 2009), one (Al-Amoush et al., 2013) found that educators' perceived adherence to constructivism is low; and one (Osin, 2014), found that educators' perceived adherence to constructivism is average.

Among the six papers that are reporting on educators' perceived adherence to self-regulated learning, five (Spruce and Bol, 2014; Kit lin lau, 2012; Toussi & Ghanizadeh, 2012; Ewijk & Werf, 2012; Ghonsooly *et al*., 2011) found that

educators's perceived adherence to self-regulation is high, and only one (Davis & Neitzel, 2011) found that educators' perceived adherence to self-regulated learning is low.

Among the three papers that are reporting on educators' perceived adherence to progressivism, two papers (Erbas 2013, Yilmaz *et al.,* 2012) found that educators' adherence to progressivism is high, and one paper (Tertemiz & Okut, 2014) found that educators' adherence to progressivism is average.

5.2.2.3 Demographics

The descriptive statistics on demographics from existing literature, as reviewed by this study, are presented in Table 5.1, Table 5.2, Table 5.4, and Table 5.5, and the number of papers for each demographic factors is summarized by Table 5.6, where it can be seen that gender, age and teaching experience, qualification, and subject specialization are the five demographics that are mostly studied by existing literature on educators' perceptions on the advantages and disadvantages on using ICTs for teaching and learning. These five demographics are the only ones whose descriptive statistics are summarized in Table 5.6.

Table 5.6: Summary of Educators' demographics from existing literature reviewed by this study.

Papers	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
MacCallum, 2009	R		R							
Getenet, 2013	R		R			R				R
Lin *et al.,* 2012										
Raman and Mohamed, 2013	R									
Shah, 2015	R		R	R						
Kale and Goh, 2012	R	R	R	R						
Persson and Mylono, 2014	R		R	R			R			R
Yunus *et al*., 2013	R		R							R
Sanchez and Aleman, 2010										
Thinyane and Thone, 2012	R									
Selwood and Pilkington, 2010										
Yang and Teng, 2014										
Shraim and Khailf, 2010	R		R					R		
Turel and Johnson, 2012	R		R				R			R
Jwaifell and Gaysaymeh, 2013						R	R			R
Najafabadi *et al*., 2013	R		R			R		R		
Belle and Brown, 2006	R									R
Raichel, 2012	R						R			R

Bertram and Waldrip, 2013			R							R
Spruce and Bol, 2014	R		R	R		R	R		R	R
Kit lin lau, 2012	R									R
Davis & Neitzel, 2011						R				R
Toussi & Ghanizadeh, 2012	R		R				R			R
Ghonsooly *et al*., 2011	R		R							R
Ewijk & Werf, 2012	R		R	R						R
Osin, 2014			R						R	R
Al-Amoush *et al*., 2013	R		R							
Esen *et al*., 2009			R							
Savasci & Berlin, 2012	R	R	R	R		R	R			R
Tertemiz & Okut, 2014			R							
Erbas, 2013	R		R				R			
Yilmaz *et al*. 2012	R					R				
Number of papers	22	2	19	6	0	7	8	2	2	16

Table 5.6 indicates that the majority of the studies reviewed in this chapter were conducted on samples having between 60% and 79% female educators, followed by the ones on samples having between 40% and 59% female educators; and only a few studies were conducted on samples having between 20% and 39% female educators or between 80% and 100% female educators. The majority of the studies reviewed were conducted on educators whose average ages are between 30 and 40 years old, followed by those whose average ages are between 41 and 50 years old, only a few studies were conducted on educators with average ages less than 30 years, and no study was conducted on educators whose average age is greater than 50 years. Table 5.6 also shows that the majority of the literature reviewed were conducted on educators whose average years of working experience are less than 5 years, followed by those whose average years of working experience are between 11 and 15 years, and a few studies were conducted on educators whose average years of teaching experience are between 6 and 10 years.

5.3 Comparing Current Empirical Study to Existing Empirical Studies

This section presents the comparison of the descriptive and inferential results of the current empirical study against empirical results from the reviewed literature.

5.3.1 Comparison of Descriptive Results

The above section indicates that only a few of the reviewed studies were conducted on female-dominated samples (more than 80%), and the fact that this study was conducted on a female-dominated sample shows that this study is doing something that is relatively new, at least for studies on the advantages and disadvantages of elearning. This argument of having a huge majority for an item group seems to only be applicable to the female group in the gender item, and it does not seem to apply to any other group for any of the other demographic items. Therefore, it is difficult to compare the descriptive results from the demographics of the population of this study against those from other reviewed studies, except for the gender demographic. Even though the current study can be singled out from the elearning literature for its female-dominated sample of educators, this does not seem to be the case for the general literature on education research. In fact, existing literature on educational research explains the feminization of the teaching profession in terms of class levels, gender of learners, subjects taught, and management responsibilities. This is well illustrated by the following quote from Acker (1983:123).

> "If we consider the modal location of men and women teachers, we observed that men and women typically teach different subjects to different groups of children, hold responsibilities for different functions within schools, and have different chances for rewards within the system. Women are more likely to teach younger children, men older; women to teach girls, men boys; women to teach domestic subjects and humanities, men technology subjects and physical sciences; women to have pastoral responsibilities, men administrative and curricular ones."

Apart from the demographic aspect, it is also important to compare the descriptive results of this study against existing literature on educators'

perceptions on the advantages and disadvantages of e-Learning, perceived adherence to constructivism, Self-regulated learning and progressivism.

Contrary to existing literature, which seems silent on whether educators perceive e-Learning as being more advantageous or not compared to traditional teaching and learning in terms of learners' adherence to social, moral and cultural practices and in terms of assessing learners' academic performance (see E4 and E5 on Table 5.3), this study found that the majority of educators believe that learning with ICTs are more advantageous than traditional teaching and learning in terms of their impact on learners' adherence to social, moral and cultural practices. However, findings from this study are in agreement with those from existing literature on the fact that the majority of educators believe that teaching and learning with ICTs is more advantageous than traditional teaching and learning in general and in specific in terms of putting teaching and learning into context, making teaching and learning resources more available, and in terms of allowing more interactions between educators and learners. On the other hand, findings from this study are in disagreement with those from existing literature on the fact that the majority of educators of this study believe that teaching and learning with ICTs is more advantageous than traditional teaching and learning in terms the reduction of the cost of education (see E8 on Table 5.3).

The current study found that, overall, the perceived adherence of educators to self-regulated learning is average (See Table 4.3); but this differs from the high perceived adherence to self-regulated learning reported by the majority of the papers reviewed by this study (See Table 5.5). A similar situation prevails for the perceived adherence of educators to progressivism, which was found by the current study as being high, but was found as being average for the majority of the papers reviewed by this study. However, findings from the current study and those from the reviewed papers are in agreement on the high level of educators' perceived adherence to constructivism.

5.3.2 Comparison of Inferential Results

The current study did not find any relationship between the demographics of educators and their perceptions on the advantages or disadvantages of using ICTs for teaching and learning. This differs from the results of existing literature as reviewed by this study, where there is a majority of papers confirming a relationship between educators' age, gender, years of teaching experience (see Table 5.1), and their perceptions of advantages and disadvantages of using ICTs for teaching and learning.

5.4 Research Gaps

The above comparison of the findings of the present study with those from the literature reviewed by this chapter suggests that there are possible gaps in existing research on the perceptions of educators on the advantages and disadvantages of using ICTs for teaching and learning. Some of these research gaps are listed below and the current study can be seen as a contribution towards bridging these gaps.

- The literature reviewed by this chapter seems silent as to whether educators' perceptions on the advantages and disadvantages of elearning are related to their perceived adherence to progressivism, or to their perceived adherence to self-regulated learning.
- The literature reviewed by this chapter seems to disregard research populations almost entirely made up of female educators.
- The literature reviewed by this chapter seems to disregard research populations almost entirely made up of educators from the Black racial group.

5.5 Recommendations

The aim of this section is to fulfil the last objective of this study, namely, to propose recommendations on how to optimize the impact of the use of ICTs on teaching and learning, based on the results of the current study.

- This study found that almost the entire population of the educators who participated in this survey are females; in other words, to put

things in simple but controversial terms, the teaching profession is predominantly appealing to the female gender, at least at the primary education level which was mostly covered by this study. This controversy seems to be echoed by studies from existing literature on education research that have attempted to explain this state of affairs not only in terms of class levels, but also in terms of the gender of learners, the subjects taught, and the management roles. The fact that these gender issues persist within the teaching profession calls for more research on how to resolve them.

- This study is in agreement with existing literature as above reviewed that there is a relationship between educators' adherence to constructivism and their perceptions on the advantages and disadvantages of elearning. Therefore, one can recommend constructivist educators as champions or promoters of elearning.
- The examination of the relationship between educators' adherence to progressivism or to self-regulated learning, and their perceptions on the advantages and disadvantages of elearning is identified above as a research gap which deserves to be filled, especially because self-regulated learning represents for learners what constructivism represents for educators. In other words, one would like to find out why there are many studies on the relationship between constructivism and elearning, but there are few studies between self-regulated learning and elearning, even though constructivism and self-regulated learning seem to represent two sides of the same coin.
- The fact that this study found that the perceptions of educators regarding elearning in the schools surveyed are positive seems to indicate that these educators are willing to adopt the use of ICTs for teaching and learning. However, what are the other reasons why these ICTs are not yet deployed in these schools? That is another kettle of fish that needs more research.

- This study overlooked some of the possible disadvantages of the use of ICTs for teaching and learning. It is in fact possible that learners' over dependence on ICTs may weaken their mental abilities in terms of retention of information, mastering of techniques such as referencing and making arithmetic operations. These possible disadvantages deserve to be studied further.

5.6 Conclusion

This chapter gave a summary of the findings of the current study and compared these findings against those from existing literature on educators' perceptions on the advantages and disadvantages of elearning. Findings from the current study are in agreement with those from existing literature that there is a relationship between educators' perceived adherence to constructivism and their perceptions on the advantages and disadvantages of elearning. This suggests that one can use constructivist educators as elearning champions or promoters. One of the major contributions of this study is to have found a relationship between educators' perceived adherence to self-regulated learning and their perceptions on the advantages and disadvantages of elearning, compared to existing literature which seems silent on that relationship despite the fact that self-regulated learning is just as important to learners as constructivism is important to educators. As for the relationship between educators' perceptions on the advantages and disadvantages of elearning, the lack of unanimity among the research findings both from this study and from existing literature calls for more research on the impact of demographic factors on the adoption of elearning.

Some research gaps identified by this current study are: dominance of the sample population by the African female educators, and the lack of evidence from the reviewed literature on the relationships of educators' adherence to progressivism, self-regulated learning and their perceptions of advantages and disadvantages of using ICTs for teaching and learning.

The first part of this conclusion was, in fact, a summary of this chapter on the fourth objective of this study to propose recommendations on how to optimize the impact of the use of ICTs on teaching and learning, based on the results of the current study. It appears that the impact of the use of ICTs on teaching and learning can be optimized through the deployment of constructivist and progressivist educators as champions of elearning projects in schools. A summary of the outcomes of other three objectives of this study is given below:

- The first objective of this study was to select from existing literature suitable theories that can be applied to the examination of educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world. This objective was met in the second chapter of this study, where suitable theories such as constructivism, progressivism, and self-regulated theories were selected to examine the educators' perceptions of the advantages and disadvantages of elearning.
- The second objective was to design a model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world. This objective was also met in the second chapter of this study by the design of a conceptual model which hypothesized relationships between educators' demographics, their perceptions on the advantages and disadvantages of using ICTs for teaching and learning, their perceived adherence to progressivism, their perceived adherence to constructivism' and their perceived adherence to self-regulated learning.
- The third objective of this study was to empirically test the above hypothesized model of the factors affecting educators' perceptions on the advantages and disadvantages of elearning in schools in the developing world. This objective was met in the third chapter of this study through a survey of 65 educators in the Camperdown

magisterial district of the Pinetown education district of KwaZulu-Natal province of South Africa. The result of this survey shows that there is no relationship between educators' demographics and their perceptions of the advantages and disadvantages of using ICTs for teaching and learning; that educators' teaching experience has a direct relationship with their adherence to self-regulated learning, and that there is also a direct relationship between the grade taught by an educator and his or her perceived adherence to progressivism. The results also showed that each of the following three variables has a direct relationship with the other two variables: perceived adherence to constructivism, progressivism and educators' perceptions on the advantages and disadvantages of elearning.

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APPENDIX

CONSENT

Statement of Agreement to Participate in the Research Study:

- I hereby confirm that I have been informed by the researcher, Obafemi Samson about the nature, conduct, benefits and risks of this study –
  Research Ethics Clearance Number: REC 75/13,
- I have also received, read and understood the above written information (Participant Letter of Information) regarding the study.
- I am aware that the results of the study, including personal details regarding my sex, age, date of birth, initials and diagnosis will be anonymously processed into a study report.
- In view of the requirements of research, I agree that the data collected during this study can be processed in a computerised system by the researcher.
- I may, at any stage, without prejudice, withdraw my consent and participation in the study.
- I have had sufficient opportunity to ask questions and (of my own free will) declare myself prepared to participate in the study.
- I understand that significant new findings developed during the course of this research which may relate to my participation will be made available to me.

_____ _____ _____ _____

Full Name of Participant **Date** **Time** **Signature / Right Thumbprint**

I, _____ (name of researcher) herewith confirm that the above participant has been fully informed about the nature, conduct and risks of the above study.

_____ _____ _____

Full Name of Researcher **Date** **Signature**

_____ _____ _____

Full Name of Witness (If applicable) **Date** **Signature**

_____ _____ _____

Full Name of Legal Guardian (If applicable) **Date** **Signature**

QUESTIONNAIRE ON EDUCATORS' PERCEPTIONS ON THE ADVANTAGES AND DISADVANTAGES OF eLEARNING (ICTs FOR TEACHING AND LEARNING)

Dear participant,

This questionnaire will only be used for research purposes and information provided by you will always remain anonymous. Please tick the box that best describes your answer for each item. Thank you.

A. Demographics

A1.	**Gender**	**Male**	☐	**Female**	☐				
A2.	**School Location**	**Urban**	☐	**Rural**	☐				
A3.	**Age Group**	**Less than 30**	☐	**30 - 40**	☐	**41 - 50**	☐	**Above 50**	☐
A4.	**Grade (Class)**	**R – 3**	☐	**4 - 6**	☐	**7 - 9**	☐	**10 -12**	☐
A5.	**Current Class size**	**1 -20**	☐	**21 -40**	☐	**41 - 60**	☐	**61 – Above**	☐
A6.	**Highest Level of Education**	**Diploma**	☐	**Bachelors**	☐	**Honors**	☐	**Masters**	☐
A7.	**Subject Specialization**	**Languages**	☐	**Mathematics**	☐	**Science and Technology**	☐	**Social Science**	☐
A8.	**Computer Usage**	**None**	☐	**Daily**	☐	**Weekly**	☐	**Monthly**	☐
A9.	**Ethnicity**	**African**	☐	**Indian**	☐	**Colored**	☐	**White**	☐ **Others** ☐
A10.	**Teaching Experience (Years)**	**0 – 5**	☐	**6 - 10**	☐	**11 - 15**	☐	**16 - 20**	☐ **Above 20** ☐

B. Educators' perceptions on learners Self-Regulation capabilities I believe that learners		**Strongly Disagree**	**Fairly Disagree**	**Weakly Agree**	**Fairly Agree**	**Strongly Agree**
B1	Do not easily get distracted from their plans.					
B2	Are able to self-evaluate their progress towards their goals.					
B3	Are able to reach their goals without external help.					
B4	Are able to learn from their mistakes.					
B5	Are able to take critical decisions.					
B6	Have personal standards that they try to live up to.					
B7	Are able to deal with unexpected situations.					
B8	Are able to seek for advice.					
B9	Have a lot of willpower.					
B10	Know what they want to be in future.					

C. Educators' perceived constructivism I believe that learners have the self-ability to		**Strongly Disagree**	**Fairly Disagree**	**Weakly Agree**	**Fairly Agree**	**Strongly Agree**
C1	Adapt acquired knowledge to different contexts.					
C2	Take responsibility for their learning.					
C3	Reach their maximum potential.					
C4	Improve their thinking skills.					
C5	Analyze situations from different perspectives.					
C6	Discover relevant strategies for new problems.					
C7	Relate educational knowledge to their daily life.					
C8	Improve their own academic performance.					
C9	Connect different types of knowledge.					
C10	Share knowledge, experiences, and ideas with others.					

D. Educators' perceived progressive teaching philosophy I believe that effective teaching happens best when educators		**Strongly Disagree**	**Fairly Disagree**	**Weakly Agree**	**Fairly Agree**	**Strongly Agree**
D1	Comment on the journals kept by learners on their learning experiences.					
D2	Prioritize learners' cooperative work (group or pair work).					
D3	Give feedback to learners on their portfolios.					
D4	Facilitate learning through activities such as role playing, drama, simulation etc.					
D5	Guide learners in the analysis of sample cases simulating learning situations.					
D6	Interact with learners during their presentations.					
D7	Draw concept maps or diagrams to explain ideas.					
D8	Supervise learners during self-discovery projects.					
D9	Make learners do research on various topics.					
D10	Use various equipment to explain concepts.					

E. eLearning (ICTs) ADVANTAGES AND DISADVANTAGES I believe that learning with ICTs is better than traditional learning in terms of		**Strongly Disagree**	**Fairly Disagree**	**Weakly Agree**	**Fairly Agree**	**Strongly Agree**
E1	Putting teaching and learning into context.					
E2	Making teaching and learning resources more available.					
E3	Allowing more interactions between educators and learners.					
E4	Adhering to social, moral and cultural practices.					
E5	Assessing learners' academic performance.					
E6	Providing dedicated attention to special needs students.					
E7	Alleviating teachers' workload.					
E8	Avoiding equipment problems in teaching and learning.					
E9	Reducing the cost of education.					
E10	Minimizing health problems in teaching and learning.					