**THE FUTURE OF TERTIARY LEARNING IN SOUTH AFRICA THROUGH SMART LEARNING**

A Research Proposal Presented to the

Graduate School of Business Leadership

University of South Africa

In partial fulfilment of the requirement for the

DOCTOR OF BUSINESS LEADERSHIP

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# ACADEMIC INTEGRITY DECLARATION

**Declaration:**

1. I understand what academic dishonesty entails and am aware of UNISA’s policies in this regard.
2. I declare that this assignment is my own original work. Where I have used someone else's work, I have indicated this by using the prescribed style of referencing. Every contribution to and quotation in this assignment from the work or works of other people has been referenced according to this style.
3. I have not allowed and will not allow anyone to copy my work with the intention of passing it off as his or her own work.
4. I did not make use of another student’s work and submitted it as my own.

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# LIST OF ACRONYMS

|  |  |
| --- | --- |
| AR | Augmented Reality |
| IBM | International Business Machines corporations |
| ICT | Information Communication and Technology |
| IoT | Internet of Things |
| MBRSLP | Mohammed Bin Rashid Smart Learning |
| MOOCs | Massive open online Courses |
| NCREL | North Central Regional Educational Laboratory |
| NYCSS | New York Commission of Smart School |
| OECD | Organisation for Economic Co-operation and Development |
| SA | South Africa |
| SPSS | Statistical Package for Social Science |
| STEM | Science Technology Engineering and Mathematics |
| TEL | Technology Enhanced Learning |
| UaaP | University-as-a-Platform |
| UAE | United Arab Emirates |

# Introduction

Due to advances in technology exponentially, there are intelligent designs that can be used in instrumenting, interconnecting and infusing all life aspects. Education, too, can be interconnected and inspired by smart designs. Recently, there is a great significance in smart education. In recent years, education projects are being performed globally concerning smart education (IBM, 2019; Mäkelä, Kankaanranta, & Helfenstein, 2014; Lee, 2012). The Malaysian first project implementation on smart education was in1997 (Mohamad & Chan, 2018), which was known as the Malaysian Smart School Implementation plan. The government supported smart schools aim to upgrade the education system to attain the education philosophy nationally and also workforce preparation, which is capable of meeting the 21st-century challenges.

In Singapore, the government is implementing the original nation plan (iN2015) whereby, technology-supported learning is the critical section (Hua, 2012). Singapore’s program has several Smart Schools establishment, whose primary aim is to diversify learning environments. IBM and Australia collaboration resulted in a smart, multidisciplinary system of Education (IBM, 2012). The Australia system connects the schools, tertiary institutions, and training of the workforce. South Korea also has a smart system of education, whose main objective is to revolutionise the education system and infrastructure improvements (Lee, 2012). In the New York program, the smart school program explains the technological roles of integrated classes (Canada, Evelyn, & Schmidt, 2014).

The New York smart learning program is focused is on increasing student's attainment and student's preparation into participating in the economy in the 21st Century. Finland also has an intelligent system of education since 2011. The purpose of Finland's smart system of education is to improve the 21st-century education by use of solutions that motivates learning and are user-driven (Mäkelä, T., Kankaanranta, M. and Helfenstein, 2014). In the (UAE) United Arab Emirates, a smart education system began in 2012 named (MBRSLP) Mohammed Bin Rashid Smart Learning Program. The key goal of MBRSLP is to introduce a new learning environment experience and a new learning culture in the United Arab Emirates public schools by the inception of smart classes.

Universities are adopting recent technologies in information and communication to bring necessary changes in the education system in countries that are developed (Shraim & Khlaif, 2010). Technological advancements make large learning environments, educational content, and improve learning through the establishment of smart educational settings (Groff, 2013). Intelligent educational environments are convenient for training learning and teaching. The establishment of smart universities has given an enormous opportunity to new learners by the extension of their potential to deliver Education (Mushtaq, Kayani, & Arif, 2015; Khalaif & Farid, 2018). Technological change helps students improve their creativity and also helps in refurbishing traditional learning (Serdyukov, 2017). Smart university learning is an integration of both formal and informal education for the establishment of a learning atmosphere that conforms to distinct learners (Graf, Kinshuk & Liu, 2010). The main reason why universities are adopting the smart universities concept is that it is useful, very efficient, and establishes a learning environment that is adaptable to the needs of the learners and learning support. Singapore, Saudi Arabia and Australia are some of the nation’s focusing on smart education and its development, thus making the new trend in the field of education globally. Now that the background of the research study discussion is over, the next section will discuss the thesis statement.

# Thesis Statement

This study strive to critically explore the evolution of smart learning, the current status of South African smart higher learning, and the future systems advances anticipated in the future and how higher learning institutions are exploiting the ubiquitous technology in South Africa. This research will also evaluate the appropriate strategies for the full realisation of smart learning in tertiary levels of learning. (Freigang, Schlenker, & Köhler, 2018).

# Problem Statement

Education is a vital building block of economic growth. A smart education system is a solution to the high levels of a education crisis in South Africa tertiary institutions. The main encounters facing higher learning in South Africa are; high costs, poorly developed study content and diverse backgrounds, languages, and race (Statistics SA, 2016). According to a study from Stellenbosch University in 2016, the cost of education in 2015 increased by 9.3% from 2014 (Fagan, Lindeque and Benatar, 2014). In 2016, a protest by students appealed for lowering the cost of tertiary education. The protest triggered the deployment of technology in teaching. (Ng'ambi, Brown, Bozalek, Gachago, & Wood, 2016).

The real benefits of technological advancements are not felt by society due to the digital gap in South Africa. The smart education system would offer equal learning opportunities in South Africa, which is one of the most significant higher education challenges (Maher, 2009). Different researchers have varied reasons for South African university's inability to fully adopt smart education systems (Venter, Jansen Van Rensburg and Davis, 2012) evaluated the following as challenges that affect smart learning: scarcity of resources, inequalities in education, low technology access, high technological costs, underutilized systems in universities, and the high cost of internet connectivity are some of the challenges. Researchers believe that weak skills in ICT, lack of resources, and accessibility to PCs and the internet being low as the challenges affecting the adoption of digital learning (OERAfrica.org, 2019).

This research seeks to evaluate the obstacles that inhibit the adoption of smart Education in South African universities and develop a framework that can be adopted by the universities to overcome the challenges of smart education adoption. The question the research study will answer is; what can enhance the change of South African tertiary schools to smart universities? The next section will discuss the significance and the rationale of the study, having identified the statement of the study problem statement. (Bozalek, Brown Gachago, Ng'ambi & Wood, 2016).

# The Rationale and importance (Significance) of the Study

The significance of this research includes;

1. The research findings will be used by the relevant higher learning institutions to offer an intuition into the various technological advancements that university managements and government can adopt in the universities. The technological advancements identified should have the capability to transform traditional universities into smart universities.
2. The university management will be assisted by this study to pinpoint the critical issues that might affect the full adoption of smart learning in the universities.
3. The findings of the research study will also assist the learners and the university management on the likely barriers that affect the successful adoption of smart learning.
4. The university management, the education ministry, and higher education technocrats will be educated by the findings on the relevant strategies to be developed to realise the dream of smart learning as a global trend. The research study will also assist in providing insight into how smart education will help the country in addressing emerging issues such as high cost of higher education and innovations.

Now that we have discussed the rationale and the importance of the research, the next section will present the main purposes of conducting this study.

# Objectives of the study

Below are the particular objectives of this research;

1. Investigate the current adoption of smart technologies in South African tertiary institutions.
2. Discover the factors that slow smart technologies embracing in South African tertiary institutions.
3. Discover the barriers to the transformation of South African Universities towards Smart universities.
4. Develop the appropriate strategies that can enhance the transformation of South African universities into smart universities.

With the development of the research study objectives, the next segment will deliberate the research questions and the hypotheses of the study.



# Hypotheses and Research Questions



## The research questions

In this study, research questions will be short, unambiguous, and free of negativity (Bryman, 2008).

1. What is the current state of adoption of the South African tertiary institutions?
2. What factors have aided the slow adoption of smart learning in South African tertiary institutions?
3. Which barriers contribute to the low uptake of smart learning in South African tertiary institutions?
4. Which strategies can be developed to enhance the adoption of smart learning by South African tertiary institutions?
5. To discover the views of South African University students on smart learning technologies.

## Hypotheses

The hypotheses for the research study are;

H1 adoption of smart learning systems has a significant relationship with the academic performance of university students.

H2 university students primary have a positive relationship between the adoption of smart learning and the academic performance of the students.

The next segment will deliberate the review of literary works in the research study.

## Literature Review

**Adoption of smart learning systems in South African Institution of higher education**

According to research on the evolution of smart learning in South African tertiary institutions, the University of Pretoria was among the initial institution of higher education that took up smart learning in 1998 (Adeylure & Kalema, 2019). The university adopted the WebCT learning system for its long-distance learning programs. According to data from OERAfrica in 2014, the University of Pretoria had over 48,000 learners based on their campuses and over 24,000 part-time and long-distance learners. The big gap between the students in the University of Pretoria under the traditional form of education and those using technology-enhanced learning necessitates the purpose of this research.

In the University of South Africa, the Sakai platform is used by instructors for resource distribution and facilitating interactions and learner’s communication by use of mobile phones. Sakai platform customisation is for administrative, academic, and tuition related needs (Davis and Venter, Jansen van Rensburg, 2012). Analysis by the researcher established that there was no full utilisation of the system. There is a necessity to grow active learners in the platform from 13% according to statistics (OERAfrica.org, 2019).

In the University of Western Cape (UCW), the university has developed its learning system known as OSS KEWL. The system is said to lack interactive engagement in factors such as social and technical factors. Failure to make the system fully interactive is a result of the academics not appreciating the benefits of an interactive system and also resistance to change. Resistance to change by instructors necessitates the study to develop mechanisms for them to accept changes and improve the learning system leading to full adoption of the system.

According to the research discussed above, there is a need for a study because data from sampled universities show that the full adoption of smart learning systems has not been realised.

According to Sibanda & Donnelly, (2014) smart learning has a positive impact on learners’ performance. The introduction of online education has dramatically enhanced the performance of learners as years passed in South Africa.

In a survey conducted in 2011 across all the tertiary institutions in South Africa about e-learning adoption in tertairy institutions, respondents were supposed to list all the technologies they frequently used in learning. The respondents were also to give the technology they felt it had utilised in innovative ways.

The survey on e-learning adoption in South Africa established that South Africa still lacks relevant policies that give clear roles of ICT in the institutions of higher learning. The Green Paper for Post-School Education and Training also recognises the need for ICT in post-school education to ensure that there is equitable access. Although there is an increase in smart devices access, a group of first-year students who arrive at the college was not to have sufficient ICT access. Some do not have even necessary computer skills (Anon, 2009). Higher learning institutions in South Africa face a need to reconsider some concepts like computer skills. The higher learning institutions should also implement the use of smart tools to help in communication and social interactions in academics (Pratt, 2014). Although a shift occurred in South African higher education from poor ICT infrastructure to cloud-based ICT, there lies a great opportunity for the institutions of higher learning to shape teaching and learning contexts. Linking sentence missing. The next literary work discuss the precise leadership required to enhance innovations and change in higher learning institutions.

**The 21st Century Higher Education Leadership**

The only way for the universities of the 21st Century to be able to counter with the emerging encounters is by embracing the qualities of an excellent leader. In the 90s, university departments considered that the only way to transform it is by recruitment of faculty members open to collaborations (Faculty Recruitment and Selection, 2014). The hiring of collaborative faculty members is useful. Still, with a fast-paced change in recent years, universities must envision by recruitment of faculty members as well as university students who possess leadership qualities that are responsive to the changes. Recruitment of leaders that are change sensitive should go together with a commitment from the institution to training and fostering of leadership and innovation to manage and stimulate change. An excellent example of an institution that has adopted envisioning is the American Institute of Biological Sciences. The institute redefined its vision through the realisation that for an institution to be leading in change, it must nurture its leaders (American Institute of Biological Sciences, 2019).

Higher education institutions require having junior members in the faculties to utilise their first years in learning leadership skills and pedagogies. One of the striking features in entrepreneurial culture in an era with rapid changes is that everyone is supposed to prepare to be a leader, a team member, and an independent thinker at one point (Faculty Recruitment and Selection, 2014). For the institutions of higher education to achieve their 21st-century potential, they are supposed to make leadership an enduring feature. Universities should aim at recruiting individuals that can support, lead, and support both institutional and scholarly change. The next literary works look at the fourth industrial revolution and its relation to the future of higher learning.

**The Fourth Industrial Revolution**

Society and education are one way connected. The connection means that education is supposed to fit in the country's trend in economics and politics (Bo & Marwala, 2017). To bridge the digital gap in the fourth industrial revolution, universities should embrace wearable-assisted teaching, training, and learning (Zhu, Sun, & Riezebos, 2016). An increase in the use of the cameras and the sensors is an indication of new technology. Higher education establishments should realise the enormous potential in the use of the wearables to revolutionise teaching. With technological advancements, some wearable technologies, for example, the augmented reality (AR), user's physical interaction, and sense can be enhanced through the creation of a virtual laboratory. Augmented reality can supplement the truth by use of information that is computer-generated in real-time, which crucial in exploration and interpretation. Debates are arising over the best way for the utilisation of fast-growing technological innovations (Schwab and WEF, 2017).

Universities should also embrace open online courses. Teaching in South African tertiary institutions is limited to the scenario of students gathering in a lecture room listening to the professor or sitting around discussing with fellow students. Technological advancements are overcoming the constraints and bringing about radical innovations in higher learning. Massive open online courses (MOOCs) are a form of education providing instructions in a stand-alone nature online (Passarelli, 2014). Two factors underpin costs in the university: limitations of productivity and physical proximity. Enrolment of more students is expensive because of the increase in buildings and university instructors. Due to productivity limitations, there is a limited number of students accommodated in a lecture room. Open online courses can be used to eradicate the constraints of productivity and physical proximity. Thus, the full adoption of open online courses would enhance more students' enrolment. Student's admission into institutions of higher learning is increasing gradually with years because the fourth industrial revolution is a stage of post-massification.

According to the researches reviewed above, there exists a gap in the rate of smart learning systems adoption and leadership that can effectively drive changes experienced in technological advancements in South Africa. The next section will look at the definitions of key concepts in this research.

# Definition of Key Concepts

Many nations are involving themselves in projects geared towards smart education globally. An example is the Malaysian smart schools whose main aim is to incubate the Malaysian labour force of the 21st Century. The Malaysian smarts schools flourished through the utilisation of the top technologies into school programs. The smart schools are a way of stimulating learner's thoughts and creativity. The smart schools are also considerate of the individual learner's differences and their learning styles. Singapore's smart educations role is to improve the experience of engaging learning in meeting the needs of learners. They can meet the learner's needs through the application of innovative technologies. (Hwang, 2014)

Through the analysis of the various global smart projects in education, one can quickly point out that the main goal of smart higher learning projects is for the preparation of the 21st workforce. A workforce born out of smart higher education has the requisite skills and knowledge that can meet the societal challenges and needs. For learners, smart refers to intelligence. Intelligence, on the other hand, denotes to a student’s ability to use the acquaintance acquired and experience in proper judgment making. According to the famous China educator, Confucius, wisdom is gained through; reflection, imitating, and expertise. Therefore, as per the learner’s context, smart would refer to the ability for learners to think reasonably and quickly, but different educational entities would have different definitions.

In educational technology, smart is a reference to the effective and efficient accomplishment of the purpose (Spector, 2014). The smart technology is inclusive of hardware and software. In hardware's context, smart denotes to much smaller, transportable, and easily inexpensive smart devices. The smart devices are the ones that support the learner in smart education. Some of the tools helpful to the learners in smart education include; laptops and smartphones are some of the learning tools. Smart devices can collect data for learning by engaging the learner in seamless learning. Software is regarded as smart if it is flexible and easily adaptive. Adaptive technologies in learning are the ones that perform personalised learning. Some adaptive technologies in learning include; adaptive engine, cloud computing, and learning analytics.

In the context of an educational environment, smart is intelligent, appealing, and capable of being scaled. Personalised services in learning are available in a smart learning environment. The resolve of customised services in smart education is to make learning efficient and effective for learners. The next section will discuss the methods, paradigm and methodologies applied in the study. (Isaías, 2018).

# Research Paradigm, Methods, and Methodologies



## Paradigm

The research study paradigm is the relation of the awareness enlargement and nature of the understanding. Research philosophies highlight how the researcher is viewing the world by choosing the strategy and methods to be used. There is no superior opinion than the other; the philosophy that will be selected affects the researcher's view. Therefore, the researcher should be meticulous on the philosophy to use. There are mainly four research paradigms that are applicable in a research study, namely; positivism, realism, interpretivism, and pragmatism research paradigms. This research study will adopt a positivist paradigm on the fact that it is related to information systems and deals with people and technology interactions. Having selected the model to be employed in the study, the next section will discuss the research methods to be applied in the study.

## Research Method

This research study will involve the use of both quantitative and qualitative data. A mixed approached will also be applicable in the research study, whereby data gathering techniques will be used sequentially in both qualitative and quantitative data. Bernard (2013) explain that that multiple methods of research choice are increasing in researches involving management. In this research, quantitative data collection will be by the use of research questionnaires administered and analysis done quantitatively. The gathering of qualitative data will be through structured interviews and analysed qualitatively and quantitatively. After adopting the mixed-method approach in the study, the next section will discuss the research design adopted in this study.

## Research Design

The study will adopt both an inductive and deductive research approach. The deductive approach will be applied because it allows extensive quantitative data used in testing the hypotheses. The inductive research approach in this research study will help in the exploration of social issues and applies to qualitative data. A sample will be analysed by the inductive approach than the large sizes associated with the deductive method. (Johannesson & Perjons, 2019).

A case study strategy will also apply to the research study. The case study research strategy involves empirically investigating a particular contemporary occurrence within the context of real-life by use of evidence derived from various sources. The reason for choosing a case study strategy in this research study is first to ensure a full understanding of the research context and the processes involved. The second reason is that the case study research strategy will help in answering the questions: Why what and how in the research study. The techniques of data collection that are applicable under the case study strategy include; structured interviews and questionnaires.

This research study will adopt a cross-sectional time horizon. It is relevant because a specific occurrence is possible to study at a specific time. A cross-sectional study is also commonly used in academic research and usually has time constraints and uses survey strategy.

# Delimitation of the Study

This research study will be carried out in all 26 South African universities spread across South Africa. The estimated population of the 26 universities, according to (South African Market Insights, 2019) is over 1million students with UNISA having the highest population of 400,000 students and the rest a combined population of 600,000 students. The next section discusses the research methodologies in this study.

# Research Methodologies



## Population

The target population for the study will be over 1 million based on all students from the 26 universities in South Africa, 26 vice-chancellors from universities in South Africa, and 15 technocrats derived from the ministry of higher education and privately practising higher education technocrats. The population derivation will be across South Africa.

## Sampling method

This study will focus on a sample that will be selected practically as a representative sample. Statistical techniques will be applied to get a sample of the larger population (Kim and Wang, 2018). There exist two sampling designs, namely; probability and non-probability designs. This research study will apply probabilistic random sampling for selecting the university students to ensure that each student in the population stands an equal probability of selection in the sample size. Non-probability sampling application will be used for selecting samples for the structured interviews. The sample size will be 664 with a 99% confidence interval calculated by use of a Raosoft sample size calculator, 26 university vice-chancellors, and 15 technocrats from the ministry of higher education. (Pickard 2013).

## Data Collection Instruments

Because it is easy to administer questionnaires, this research study will adopt both open and closed-ended questionnaires as the research instrument. Structured interviews will also be used to complement the questionnaires, with each variable having three indicators. The instruments will consist of student's questionnaire, vice-chancellors interview, and the technical interview with the ministry of higher education and higher education technocrats. The questionnaire will have three sections, whereby; section A will be used to collect the respondent's biodata and giving general guidelines. Section B will represent the data collection on the identified variables of the study. Section C of the questionnaire will represent collecting quantitative data on the research study.

There will be a pilot study consisting of 52 university students across all the universities in South Africa, 13 vice-chancellors, and seven higher education technocrats to ensure that the questionnaire will be consistent and address the issues relating to smart learning. The sample selection will be on a convenience basis rather than a scientific sample size. (Sakunasigha, 2006) The testing of the questionnaire will be a small number of respondents. 13 interviews will be conducted with vice-chancellors and seven structured interviews with higher education technocrats across South Africa. The questionnaire pilot test will help in pointing out its limitation in terms of the language used, how user-friendly it is, and the suitability of the instrument adopted. Williams, (2011) agree that piloting of the questionnaire is very critical during questionnaire design.

## Data Collection Fieldwork

To minimise the costs of hiring people to administer the questionnaires, there will be internet-mediated self-administered questionnaires that will be used. An internet-mediated questionnaire will ensure those vast geographical areas across South Africa will be covered. The other benefit of an internet-mediated questionnaire is that the respondents will have the choice of when to answer the questions. The internet-mediated questionnaire will also help enhance privacy as an ethical consideration of the study. For the structured interviews, conducting one-on-one interviews with the respondents is vital. Williams, (2011)

## Data Coding and Analysis

This research study will apply both inferential statistics and descriptive for the analysis and interpretation of data. The study will use Structural Equation Modelling for content analysis. Structural equation modelling is a multivariate technique in statistics that applies to relationships studying between observed variables and latent variables in a model (Kang & Qureshi, 2015).

The use of Structural Equation Modelling will be valuable in this research study because it will help in testing and proving the hypothetical study foundations (Jenatabadi and Ismail, 2014).

The use of structural equations in the research study will be beneficial in calculating the p-values and the regression coefficients in the study.

Descriptive statistics will be adopted in this study to highlight the frequencies, data means, percentages, and standard deviations.

Data will be collected first via an internet-mediated self-administered questionnaire, it will then be classified, and analysis will be done, followed by tabulation and interpretation by use of various statistical techniques.

Data analysis in this research study will be analysed by the use of SPSS 24.0 and the formation of structural equation modelling through outsourcing the services of a statistician.

This research study will ensure that data will go through the following for spiral stages to ensure the derivation of the conclusion is meaningful;

1. Organisation stage- in this stage, extensive data collected from the field will be broken down into smaller pieces.
2. Perusal stage- this will involve delivering the meaning of the data.
3. Classification stage- involves clustering off data into categories to deliver meaning
4. The synthesis stage- consists of looking at the tables, hypotheses, and diagrams.

The next section discusses the ethical limitations in our study and how they will be addressed.

# Ethical Considerations

Leedy and Ormorod (2014) appreciate that considering ethics in a research study is a critical duty to be accomplished during a research study. Ethical consideration will be very vital during this research study because;

1. It will help to promote the research aims
2. They will help supporting collaborations between the researchers and the participants which are very crucial in any study
3. They will help in the holding of the researcher accountable for any action
4. They will support principles of not harming others

Some of the key ethical considerations to be considered during this research study will include;

The nature of participation will be voluntary, and the respondent has the right to entirely or partly withdraw from the research study: the respondents in the research questionnaires and the interviews will have an obligation to answer the questions or agree for an interview. There will be no rewards for participating in the research, and thus f participation in the study will be wholly voluntary. Thus ensuring that the participants agree to be part of the study by clearly outlining the relevance of the research. The confidentiality of the participants should remain anonymous.

Respondent’s privacy: maintaining the participant’s confidentiality will be by ensuring that they remain anonymous after participating in the research. For the structured interviews, anonymity can be impossible because there will be face to face interviews; thus, the respondent will be required to give consent first.

Researcher's behaviour and objectivity: to prevent a situation where the researcher already has an opinion on the subject at hand and also researchers skewing of the research question, research results will be fed back to the respondents to increase the researcher's objectivity. The researcher will present a carefully designed research with an outcome that is worthwhile.

Data confidentiality: during the administration of the questionnaires, participant’s privacy when answering the questions will be possible because the researcher will not be there. The researcher will monitor confidentiality during the conducting of the interviews because it will be a face to face conversation.

Application of Ethical clearance from the University of South Africa that will bind this research as per UNISA research policies and regulations is vital. The next section will look at how the dissertation will be broken down in chapters.

# Outline of the Dissertation

Chapter one- introduction

This chapter will discuss the purpose of the research, the problem statement, the background to the problem, objectives of the study, and an introduction to smart learning in South Africa and globally.

Chapter two-Literature review

This chapter will cover academic research on smart higher education. The chapter will also reflect information from investigations carried out to address the research problem. Conclusions of similar research studies are looked at in this section. Gaps will be identified in the existing literature to clarify the importance of conducting this research study. Sources of the information to be reviewed will include; journal articles, reports, and working papers.

Chapter three-Research methodology

This chapter will deliberate on the research design and approaches. The research methodology explanation is done in this section, instruments to use, techniques for data collection, sampling methodology to be applied, and the sample size determination techniques. Analyses of data will also be done in this chapter and highlighting the limitations encountered during the study. The chapter also looks at ethical considerations during the research study.

Chapter four-Data presentation

This chapter will give the outcomes of the research study. Results will be presented concerning strategy, choice, philosophy, and time horizon. Research methodology considerations will involve; target population, sampling design, sample frame validity, reliability instruments of research, techniques of data collection, and hypothesis testing.

Chapter Five- Analysis and discussion of data findings

This chapter will involve discussing the findings of the research study concerning smart higher education learning. The findings in Chapter 4 will be triangulated into a literature review.

Chapter six- Recommendations and Conclusion

In this chapter, a summary of the objectives of the study is given. Also, the critical findings from the study are highlighted in this section. Conclusions, interpretations, and recommendations will be given to the university students, vice-chancellors, and higher education technocrats for their synthesis and execution. The next section presents the research plan in this study.

# Research Plan

The following table represents the schedule for this research study.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Task | Starting date  (Week) | Time to be taken(Week) | Whether the task is Parallel or Sequential | Task depends on |
| 1 | Review of literature |  |  |  |  |
| 2 | Interview schedule development |  |  |  |  |
| 3 | Piloting of the interviews |  |  |  |  |
| 4 | Finalisation of the interview and questionnaire administration schedule |  |  |  |  |
| 5 | Respondents selection |  |  |  |  |
| 6 | Conduct interviews |  |  |  |  |
| 7 | Piloting of the questionnaire |  |  |  |  |
| 8 | Respondents selection |  |  |  |  |
| 9 | Administering the questionnaire |  |  |  |  |
| 10 | Analysis of the findings |  |  |  |  |
| 11 | Research write up |  |  |  |  |

The next section will discuss the factors that may compromise our research plan realisation.

# Limitations of the Research

Smart learning in South African universities is still in its developmental stages. The universities are still far from full smart learning integration in their curriculum development. Therefore, some respondents don’t have enough experience in smart learning in South Africa.

Due to the budget implications, the sample size has to be small compared to the vast population of South African Universities. Also, the purchase of efficient but expensive research tools is hindered.

For the structured and focus group interviews, the presence of the researcher might influence the respondent’s responses.

# Summary

**Problem statement**

To explore developing a framework that can be adopted by students, university management and education ministry, and tertiary education technocrats to overcome the challenges of smart education adoption in tertiary institutions in South Africa.

**Aims and Objectives of the Study**

This study purposes to discover the issues that slow the adoption of smart education in tertiary institutions in South Africa and develop the appropriate strategies that can enhance the full transformation of higher learning into smart learning.

**Research Method**

The research study will use the mixed data method. A mixed approach method will be applied, whereby data collection techniques will be sequentially used in qualitative and quantitative data. Quantitative data will be gathered by the use of a questionnaire, while the use of structured interviews will collect qualitative data.

**Research Ethics**

Involvement in the study will be purely unpaid, contributors' privacy will be highly guarded, data received from the respondents will be confidential, and UNISA research regulations and policies will be highly observed.

**Significance**

The significance of this research study is to develop strategies that will be adopted by students, university management, and the education ministry for the full realisation of smart universities in South Africa.

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